NAVSHIPS 915

INSTRUCTION BOOK

for

KEYERS
KY-58/GRT AND KY-75/SRT

NATIONAL COMPANY, INC.
MALDEN 48, MASSACHUSETTS

BUREAU OF SHIPS NAVY DEPARTMENT

Radio III

NAVSHIPS 91543

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NATIONAL COMPANY, INC.
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BUREAU OF SHIPS NAVY DEPARTMENT

Contracts: NObsr-42513
NObsr-52052

Approved by BuShips: 6 OCTOBER 1951

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
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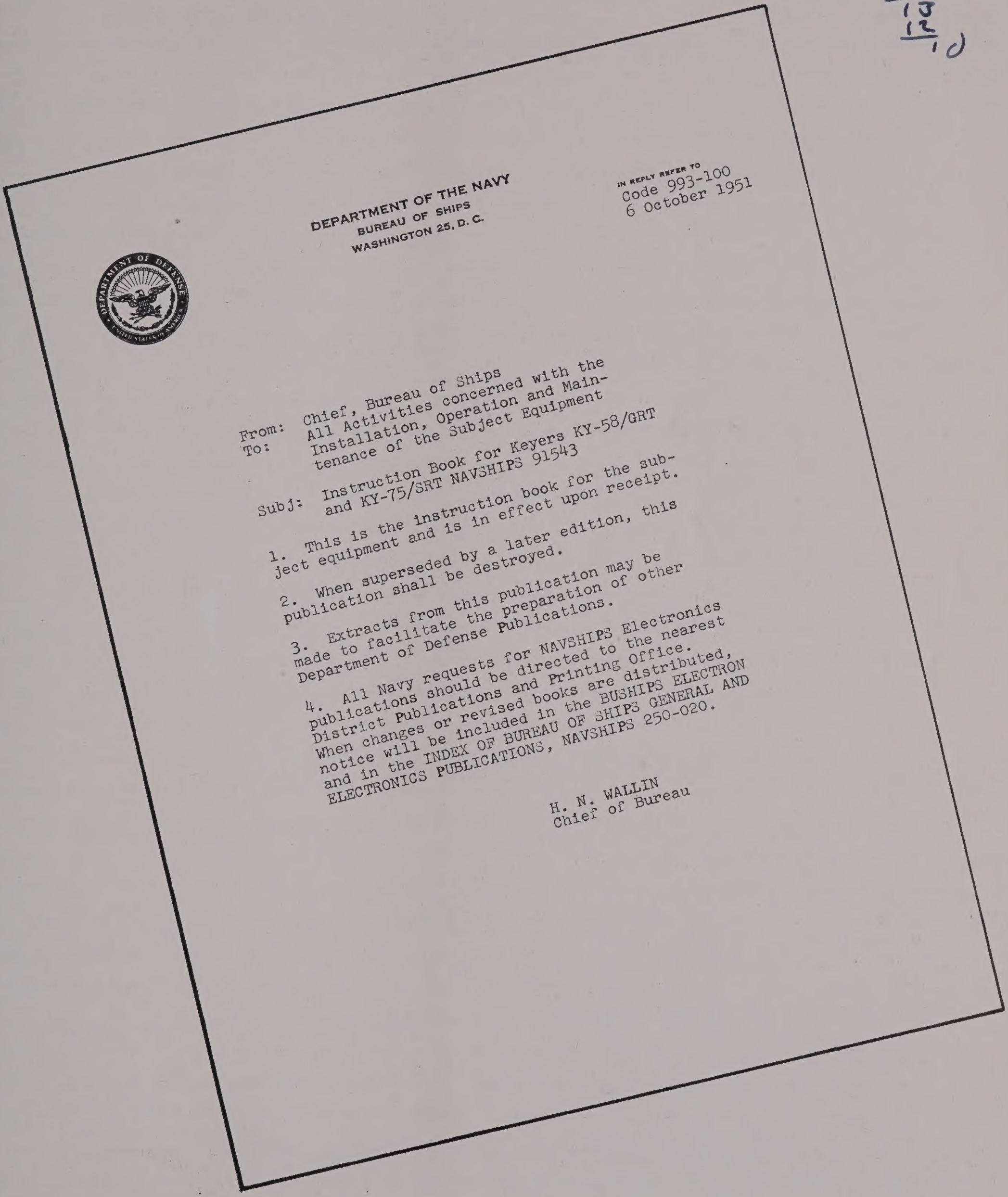

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.

IN REPLY REFER TO
Code 993-100
6 October 1951

From: Chief, Bureau of Ships
To: All Activities concerned with the Installation, Operation and Maintenance of the Subject Equipment

Subj: Instruction Book for Keyers KY-58/GRT and KY-75/SRT NAVSHIPS 91543

1. This is the instruction book for the subject equipment and is in effect upon receipt.

2. When superseded by a later edition, this publication shall be destroyed.

3. Extracts from this publication may be made to facilitate the preparation of other Department of Defense Publications.

4. All Navy requests for NAVSHIPS Electronics publications should be directed to the nearest District Publications and Printing Office. When changes or revised books are distributed, notice will be included in the BUSHIPS ELECTRON and in the INDEX OF BUREAU OF SHIPS GENERAL AND ELECTRONICS PUBLICATIONS, NAVSHIPS 250-020.

H. N. WALLIN
Chief of Bureau

RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	SIGNATURE OF OFFICER MAKING CORRECTION

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GUARANTEE

The equipment including all parts and spare parts, except vacuum tubes, batteries, rubber and material normally consumed in operation is guaranteed for a period of one year from the date of delivery of the equipment to and acceptance by the Government with the understanding that all such items found to be defective as to material, workmanship or manufacture will be repaired or replaced, f.o.b. any point within the continental limits of the United States designated by the Government, without delay and at no expense to the Government, provided that such guarantee will not obligate the Contractor to make repair or replacement of any such defective items unless the defect appears within the aforementioned period and the Contractor is notified thereof in writing within a reasonable time and the defect is not the result of normal expected shelf life deterioration.

To the extent the equipment, including all parts and spare parts, as defined above is of the Contractor's design or is of a design selected by the Contractor, it is also guaranteed, subject to the foregoing condition, against defects in design with the understanding that if ten percent (10%) or more of any such said item, but not less than two of any such item, of the total quantity comprising such items furnished under the contract, are found to be defective as to design such item will be conclusively presumed to be of defective design and subject to one hundred percent (100%) correction or replacement by a suitably redesigned item.

All such defective items will be subject to ultimate return to the Contractor. In view of the fact that normal activities of the Naval Service may result in the use of equipment in such remote portion of the world or under such conditions as to preclude the return of the defective items for repair or replacement without jeopardizing the integrity of Naval communications, the exigencies of the Service, therefore, may necessitate expeditious repair of such items in order to prevent extended interruptions of communication. In such cases the return of the defective items for examination by the Contractor prior to repair or replacement will not be mandatory. The report of a responsible authority, including details of the conditions surrounding the failure, will be acceptable as a basis for affecting expeditious adjustment under the provisions of this contractual guarantee.

The above one year period will not include any portion of time the equipment fails to perform satisfactorily due to any such defects, and any items repaired of replaced by the Contractor will be guaranteed anew under this provision.

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the Bureau of Ships Manual or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustment inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties always remove power and discharge and ground circuits prior to touching them.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

INSTALLATION RECORD

Contract NObsr-42513	30 June 1948
Contract NObsr-52052	30 October 1950

Serial Number of equipment ....

Date of acceptance by the Navy ....

Date of delivery to contract destination ....

Date of completion of installation ....

Date placed in service ....

Blank spaces on this page shall be filled in at time of installation.

REPORT OF FAILURE

Report of failure of any part of this equipment, during its entire service life, shall be made to the Bureau of Ships in accordance with current regulations using form NAVSHIPS NBS 383 (revised). The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures see Chapter 67 of the Bureau of Ships Manual or superseding instructions.

ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Federal stock number or, when ordering from a Marine Corps or Signal Corps supply depot, the Signal Corps stock number.
2. Name and short description of part.

If the appropriate stock number is not available the following shall be specified:

1. Equipment model or type designation, circuit symbol, and item number.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. JAN or Navy type number.

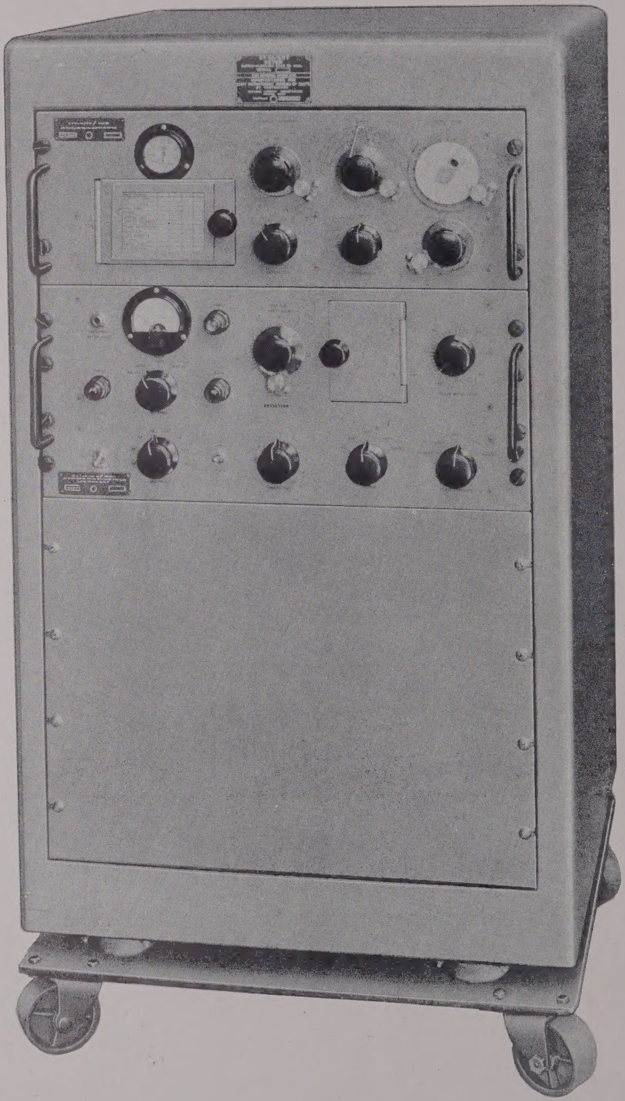

Figure 1–1. Keyer KY-58/GRT

SECTION 1
GENERAL DESCRIPTION

1. SCOPE OF THIS MANUAL.

Frequency-Shift Keyers AN types KY-58/GRT and KY-75/SRT furnished under Contracts NObsr-42513 and NObsr-52052 are described and discussed in this manual.

2. PURPOSE AND BASIC PRINCIPLES.

The AN types KY-58/GRT and KY-75/SRT keyers are directly calibrated frequency-shift exciters in which signaling is accomplished by shifting a constant amplitude carrier between two fixed frequencies representing the marking and spacing conditions of the telegraph code or the varying intensity of the facsimile (photo) signal.

The keyers can be connected to different types of Navy transmitters and are arranged so that closure of the contacts of a telegraph key, or a teletypewriter, produces a marking signal which causes the transmitter to emit a frequency above the mean assigned frequency of the transmitter. The opening of the contacts of a telegraph key or a teletypewriter produces a spacing signal which causes the transmitter to emit a frequency below the normal assigned frequency of the transmitter. The varying facsimile signal produces a marking and spacing condition similar to that of frequency-shift keying.

The primary purpose of the frequency-shift keyer is to replace the conventional exciter of a C.W. transmitter, with a source of R.F. excitation that can be shifted in frequency a small amount upward and downward to produce R.F. telegraph or facsimile signals corresponding to the d.c. polar, neutral or facsimile input signals connected to the keyer.

The AN types KY-58/GRT or KY-75/SRT keyers transmit a type F1 frequency shift signal or F4 facsimile signal in the frequency range of 1 to 6.7 megacycles. The output of the keyer can be applied to any existing C.W. transmitter, capable of operating from a 2 to 20-volt excitation source, for passage through class 'C' amplifier or multiplier stages. The keyer is used principally for comparatively long distance communications in the high-frequency range.

3. DESCRIPTION OF UNITS.

The AN types KY-58/GRT and KY-75/SRT keyers are directly calibrated frequency-shift exciters designed for the transmission of frequency-shift telegraph and facsimile (photo) signals. The keyers are identical in electrical and mechanical construction except that the KY-58/GRT is mounted in the upper section of a mobile cabinet CY-1132/GRT whereas the KY-75/SRT cabinet CY-1133/SRT is designed for mounting atop an operating table or bench. The keyers are composed of two sub-units, a Modulator-Power Supply MD-165/URT and an Amplifier-Oscillator AM-655/URT. The MD-165/URT incorporates the power supply and all modulator circuits and controls up to but not including the reactance tube. The AM-655/URT incorporates the crystal oven, reactance tube, 200-kc. oscillator and all R.F. circuits and controls. Both units can be independently removed from the cabinet and serviced or replaced. All necessary operating controls are located on the front panel. Semi-operating controls are mounted on a sub-panel recessed behind the main front panel. Access to the semi-operating controls is made possible by a hinged front-panel door.

The keyers are designed for operation from an A.C. source of 115 or 230 volts, 50/60 cycles, single phase. Rated power output of the equipment is 6 watts into a 75-ohm non-inductive resistive load throughout its frequency range of 1 to 6.7 megacycles. The frequency range is covered by a three position bandswitch with calibrated frequency ranges of 1 to 1.8 megacycles, 1.8 to 3.5 megacycles and 3.5 to 6.7 megacycles. A four-position switch is provided for selection of one of three crystals, a fourth position is provided so that an external oscillator can be used. The frequency-shift of the keyers is adjustable over a range of zero to 1000 cycles-per-second in order that the actual transmitter frequency may be adjusted to any value from 0 to 500 cycles-per-second higher than the assigned frequency for the MARK signal and the same number of cycles lower than the assigned frequency for the SPACE signal. The equipment is capable of being keyed up to 240 dot-cycles per second. The frequency-shift cap-

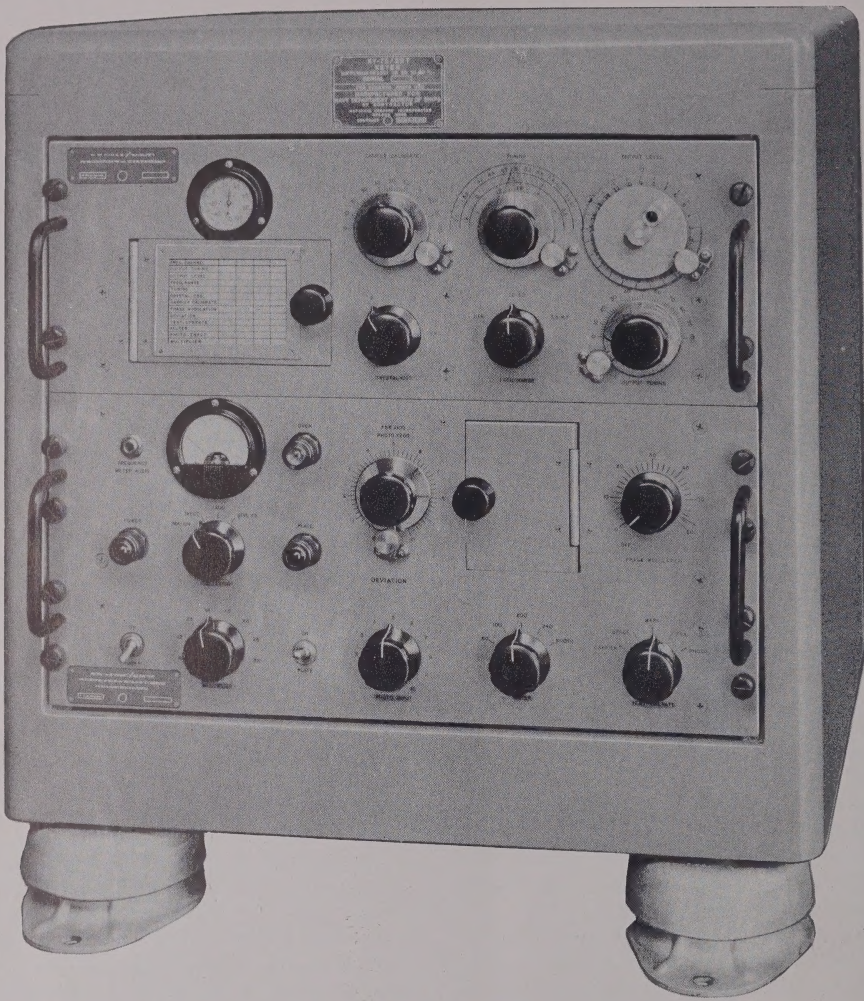

Figure 1–2. Keyer KY-75/SRT

abilities for photo transmission provide a frequency variation of any value between 0 and 2000 cps. i.e., 0 ±1000 cps. with respect to the assigned frequency. The main tuning tank of the 200-kilocycle oscillator, the frequency-determining crystals of the R.F. oscillator and the grid-cathode capacitor of the reactance modulator are mounted within a thermostatically controlled oven.

A four-section tuning capacitor is used to gang all circuits in the R.F. section except for the final amplifier plate circuit which is independently tuned and loaded. A multi-purpose meter and three-position wafer switch are utilized to obtain a visual indication of the photo input voltage, final grid and plate tuning.

4. REFERENCE DATA.

a. NOMENCLATURE.–AN type KY-58/GRT keyer, AN type KY-75/SRT keyer.

b. CONTRACT NUMBERS AND DATES.–Contract NObsr-42513 dated 30 June 1948. Contract NObsr-52052 dated 30 October 1950.

c. CONTRACTOR.–National Company, Inc., Malden, Massachusetts, U.S.A.

d. COGNIZANT NAVAL INSPECTOR.—Inspector of Naval Material, Boston 10, Massachusetts.

e. NUMBER OF PACKAGES INVOLVED PER COMPLETE SHIPMENT OF EQUIPMENT.

(1) One crate containing the Keyer and two instruction books.

(2) One crate containing equipment repair parts.

f. TOTAL CUBICAL CONTENTS.

(1) CRATED.

(a) Keyer KY-58/GRT — 19 cu. ft.
(b) Keyer KY-75/SRT — 13.5 cu. ft.
(c) Equipment Repair Parts — 1.89 cu. ft.

g. TOTAL WEIGHT.

(1) CRATED.

(a) Keyer KY-58/GRT — 404 lbs.
(b) Keyer KY-75/SRT — 346 lbs.
(c) Equipment Repair Parts — 65 lbs.

(2) UNCRATED.

(a) Keyer KY-58/GRT — 270 lbs.
(b) Keyer KY-75/SRT — 220 lbs.
(c) Equipment Repair Parts — 52 lbs.

h. FREQUENCY RANGE.—1 to 6.7 megacycles when used with crystals resonant between 0.8 and 6.5 Mc. or with a master oscillator covering this range and having an R.F. output from 2 to 20 volts across a 75-ohm load impedance.

i. TUNING BANDS.—Three bands: 1.0 to 1.8 Mc., 1.8 to 3.5 Mc. and 3.5 to 6.7 Mc.

j. NUMBER OF PRE-SET FREQUENCIES.—Three

k. TYPE OF FREQUENCY CONTROL.—Internal crystal oscillator or external high-frequency oscillator and 200 Kc. oscillator.

l. TYPE OF EMISSION.—F1, frequency-shift telegraphy or F4 facsimile.

m. NOMINAL CARRIER OUTPUT.—6 watts into a 75-ohm, non inductive resistive load.

n. CRYSTALS AND HOLDERS.—Three CR-27/U quartz crystals in HC-6/U holders or three crystals of similar characteristics in HC-1/U holders. Mechanical arrangement of holders prohibits use of more than three crystals at a time.

o. IMPEDANCE.

(1) Frequency-shift input impedance — 100,000

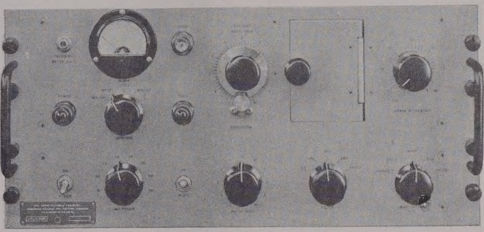
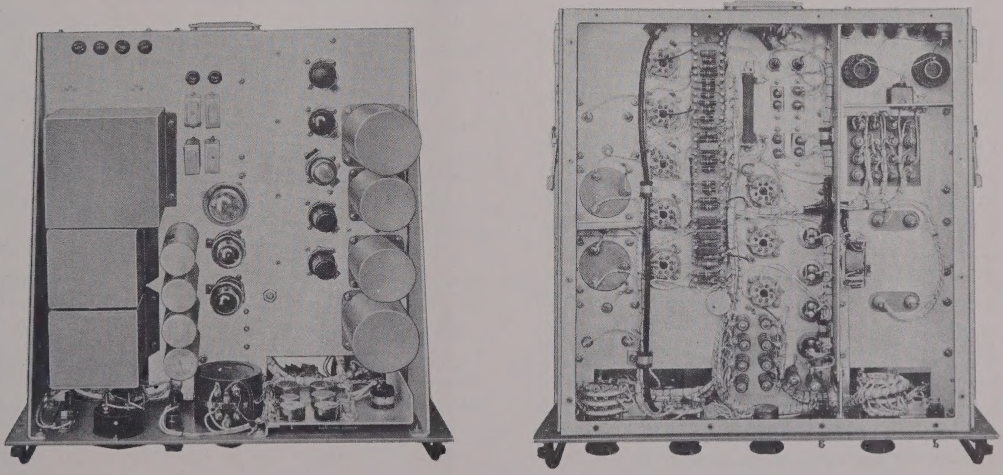

Figure 1—3. Modulator-Power Supply MD-165/URT

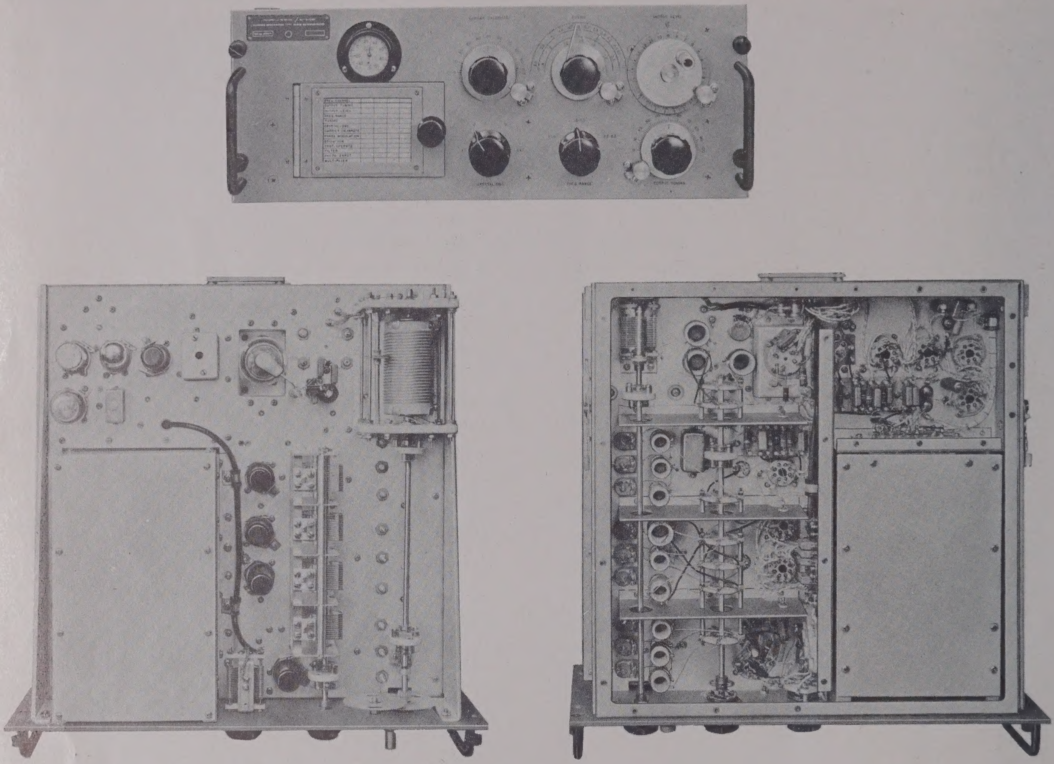

Figure 1—4. Amplifier-Oscillator AM-655/URT

ohms.

(2) Photo input impedance — 600 ohms.

(3) Output impedance — 75 ohms.

p. KEYING VOLTAGE.—D.C. Polar (+ for mark and - for space) ±40 to ±150 volts.

D.C. Neutral (+ for mark and 0 for space) +40 to +150 volts.

q. KEYING SPEED.—Zero to 240 dot-cycles per second.

r. KEYING SOURCE.—Navy Tone Keyer (type CW-50124 or CRV-50059) or teletype with a 2000-ohm termination.

s. FREQUENCY SHIFT.—Adjustable from zero to 1,000 cycles total shift, symmetrical with respect to the assigned carrier frequency.

t. FREQUENCY SHIFT FOR PHOTO TRANSMISSION.—From zero to 2000 cycles total shift, symmetrical with respect to the assigned carrier frequency. Shift is linear throughout this range.

u. PHOTO INPUT VOLTAGE.—0-20 volts.

v. PHASE MODULATION.—Phase modulation frequency of 200 cycles per second ±5%, amount of phase shift adjustable up to one radian.

w. MULTIPLICATION FACTOR SWITCH.—Accommodates transmitter frequency multiplication of 1, 2, 3, 4, 6, 8, 9 and 12 times.

x. TEMPERATURE OF OSCILLATOR OVEN.—70°C ±1%.

y. FREQUENCY STABILITY.—Stability of 200 kc. oscillator is ±75 cycles. Overall stability within 0.01% at 1 Mc. and 0.003% at 6.7 Mc. and varying linearly between.

z. MOUNTING.—KY-58/GRT mounted in upper section of mobile cabinet. KY-75/SRT shock mounted for use on top of a table or bench.

aa. INSTALLATION.—KY-58/GRT - shore-based
KY-75/SRT - shipboard use.

bb. CHARACTERISTICS OF POWER SUPPLY REQUIRED FOR OPERATION.

(1) Type — Self contained full-wave rectifier.

(2) A.C. Voltage - 115 or 230 volts.

(3) Frequency — 50/60 cycles.

(4) Number of phases – Single phase.

(5) Power consumption at 115 volts – oven heat on – 470 watts, 477 VA.

(6) Power consumption at 115 volts – oven heat off – 165 watts, 171 VA.

(7) Standby power at 115 volts – oven heat on – 370 watts, 379 VA.

(8) Standby power at 115 volts – oven heat off – 65 watts, 73 VA.

(9) Maximum plate current – 220 MA at 270 volts D.C.

cc. LIMITER ACTION.–Change in deviation, SPACE to MARK with SPACE at 0 volts and MARK variable – 0.4% as MARK is increased from 40 to 150 volts positive. Change in deviation SPACE to MARK with MARK at 100 volts positive and SPACE variable from 0 to 150 volts negative – 2%.

dd. CHANGE IN CARRIER DUE TO.

(1) Keying pulse change from 40 to 120 volts (polar or non-polar) – 10 cycles.

(2) Multiplier switch setting – 4 cycles.

(3) Line voltage variations of plus or minus 10% – ±12 cycles.

(4) Input filter switch setting – 4 cycles.

(5) Tuning procedure (RF) – 3 cycles.

(6) Ambient temperature variation from -20°C to +50°C – 25 cycles.

(7) Locked key at full power 6 hours – 10 cycles.

TABLE 1–1. EQUIPMENT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	AN OR NAVSHIPS DESIGNATION	OVERALL DIMENSIONS			VOLUME CU. FT.	WEIGHT LBS.
			HEIGHT	WIDTH	DEPTH		
1	Frequency-Shift Keyer	KY-58/GRT	41 7/16"	22 1/8"	26 9/16"	14.1	270
1	Set of Cables		1 1/2"	1 1/2"	12'	.188	20
2	Instruction Books	Navships 91543	11 1/2"	8 3/4"	1/2"	.03	1.0
1	Equipment Repair Parts		12 1/4"	18 1/4"	9 1/8"	1.18	52
or							
1	Frequency-Shift Keyer	KY-75/SRT	24 1/2"	22 1/8"	26 9/16"	8.33	220
1	Service Cable		6' 3" lg.	—	—	—	—
2	Instruction Books	Navships 91543	11 1/2"	8 3/4"	1/2"	.03	1.0
1	Equipment Repair Parts		12 1/4"	18 1/4"	9 1/8"	1.18	52

TABLE 1–2. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS		OVERALL DIMENSIONS			VOLUME CU. FT.	WEIGHT LBS.
	NAME	DESIGNATIONS	HEIGHT	WIDTH	DEPTH		
1	Keyer	KY-58/GRT	48"	27 1/4"	25 1/8"	19.0	404
	Instruction Books	Navships 91543					
	Set of cables						
1	Equipment Repair Parts		13 7/8"	21 5/8"	10 7/8"	1.89	65
or 1	Keyer	KY-75/SRT	29"	25 1/4"	31 7/8"	13.5	346
	Service Cable						
	Instruction Books	Navships 91543					
1	Equipment Repair Parts		13 7/8"	21 5/8"	10 7/8"	1.89	65

TABLE 1–3. ELECTRON TUBE COMPLEMENT

TUBE	QUANTITY	DESCRIPTION
6H6	2	twin diode
6SN7/WGT	2	twin triode
6J5	1	triode
6AC7W	1	sharp cut-off pentode
6SJ7W	3	sharp cut-off pentode
6SA7	2	pentagrid converter
807	1	beam power amplifier
OD3/VR150	2	voltage regulator
5U4	1	full wave rectifier
OA3/VR75	1	voltage regulator

SECTION 2
THEORY OF OPERATION

1. GENERAL THEORY AND DESCRIPTION.

The AN types KY-58/GRT and KY-75/SRT keyers are used at the transmitting station of a long distance radio system to adapt existing transmitters to frequency-shift or facsimile types of transmissions. Telegraph or facsimile signals to be applied to the keyer may be originated at a station equipped with a photo scanner, telegraph key, a teletypewriter keyboard or a tape transmitter. The distant receiving station similarly may be equipped to receive facsimile signals by means of a facsimile recorder; reception of telegraphic characters may be accomplished by aural means or automatically recorded or printed on a teletypewriter or tape recorder. Both the originating and terminating telegraph stations may be

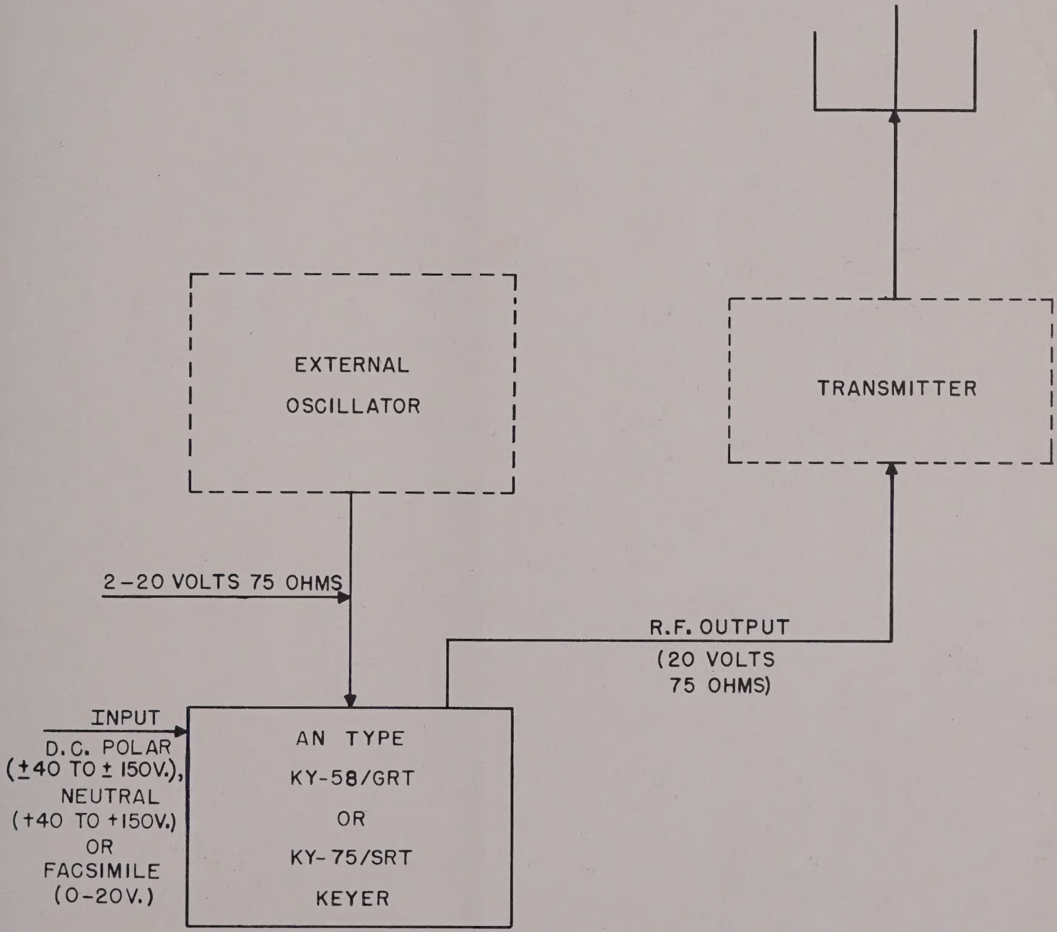

Figure 2-1. Block Outline of Transmitting Installation Employing the Keyer

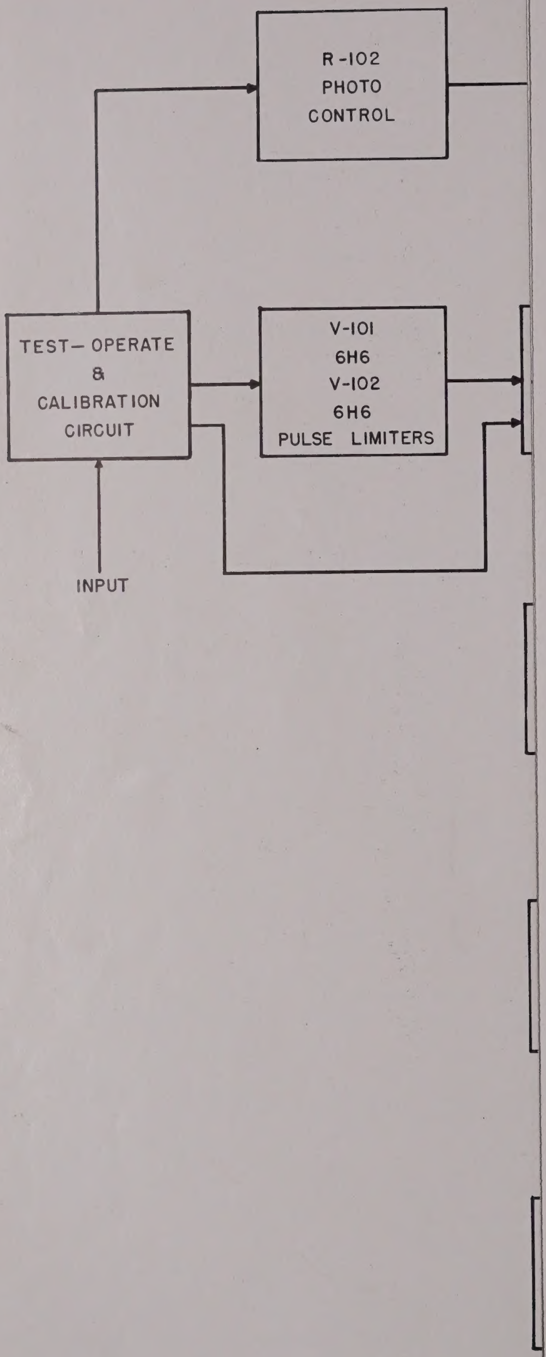

Figure 2-2. Funct

at a remote point from the transmitting and receiving stations with interconnections by land lines or a communications control system. Refer to Figure 2–1 for a block outline of a transmitting installation employing the keyer.

The keyer components are mounted on two chassis. The KY-58/GRT is mounted in a mobile cabinet CY-1132/GRT,whereas the KY-75/SRT cabinet CY-1133 /SRT is designed for mounting atop an operating table or bench. All necessary operating controls are mounted on the front panel. Semi-operating controls are mounted on a sub-panel recessed behind the front panel. External and interconnecting receptacles are located at the rear of the cabinet.

a. FRONT PANEL CONTROLS.–The operating control knobs, dials and meter are located and identified on Figure 3–7. Semi-operating controls are recessed behind the front panel.

b. FUSES AND RECEPTACLES.–Three circuit fuses and three spare fuses are provided at the top rear of the MD-165/URT chassis. Two blister assemblies mounted at the rear of the cabinet provide a means of interconnecting the two units and connecting the keyer to associated equipment. All connections into each chassis are made through a multiconnector in the blister assembly which mates with a multiconnector on the chassis. See Figures 3–1 and 3–2 for illustrations of cable assemblies and blisters.

c. TEMPERATURE-CONTROLLED OVEN.–Components of the 200-kc. oscillator, frequency determining crystals of the crystal oscillator and the reactance tube grid-cathode capacitor are mounted in a closed oven equipped with heater resistors thermostatically controlled to maintain the temperature of the oven at 70°C. The close regulation of the temperature of the components in the oven provides for more uniform circuit constants to maintain proper frequency stability of the crystals and 200-kc oscillator. The oven thermoswitch control is also located in the oven.

d. CHASSIS ARRANGEMENT.

(1) AMPLIFIER-OSCILLATOR AM-655/URT.–The following electrical circuits are mounted on the AM-655/URT; crystal oscillator and amplifier, balanced mixers, low-frequency oscillator, balanced reactance modulator, buffer amplifier, final amplifier and output circuits, temperature controlled oven, voltage regulator and current regulator.

(2) MODULATOR-POWER SUPPLY MD-165/URT. –The following electrical circuits are mounted on the MD-165/URT; test-operate and calibrate circuit, photo input control, pulse limiters, phase modulation oscillator, phase modulation control, cathode follower, pulse shaper, deviation dividers, deviation controls, power supply and two voltage regulators.

2. GENERAL CIRCUIT DESCRIPTION.

See Figure 2-2 for a functional block diagram and Figure 7-21 for a schematic diagram of the keyer.

The AN types KY-58/GRT and KY-75/SRT keyers are frequency-shift keyers designed for the transmission of frequency-shift telegraphy and/or facsimile (photo) signals over a frequency range of 1.0 to 6.7 megacycles.

Basically the keyers consist of three functional sub-divisions as follows:

RF circuits -- crystal oscillator and amplifier, balanced mixers, low-frequency oscillator, balanced reactance modulator, buffer amplifier, final amplifier and output circuits.

Modulator circuits -- test-operate and calibrate circuit, photo input control, pulse limiters, phase modulation oscillator, phase modulation control, cathode followers, pulse shaper, deviation dividers and deviation controls.

Power Supply -- a full-wave rectifier stage, three voltage regulator stages and an A.C. filament current regulator stages.

a. MODES OF OPERATION.

(1) FREQUENCY-SHIFT.–The input radio frequency of the keyer may be that of an external oscillator, such as the transmitter master oscillator, or that of the self-contained crystal oscillator. The keyer oscillator V-110 is equipped with six crystal sockets XY-101 to XY-106 inclusive: three for HC-6/U crystal holders and three for HC-1/U crystal holders. One of each type of socket is utilized for each crystal position. The sockets are so arranged that it is physically impossible to plug two crystals into any two parallel sockets at the same time. Any one of three crystals or an external oscillator may be selected by the four-position CRYSTAL-OSC. switch S-106. The input frequency of the keyer is in the range of 0.8 to 6.5 mcs. which is 200 kcs. less than the output frequency of the keyer. The frequency of a 200-kc. oscillator V-107 is frequency modulated by a balanced reactance modulator V-106 which, by varying the amount of reactance across the oscillator tuned circuit, decreases or increases the frequency of the oscillator a small amount in response to mark and space signals. The radio-frequency output of the crystal oscillator V-110 and the frequency-modulated output of the 200-kc. oscillator V-107 are combined in a balanced mixer circuit consisting of V-108 and V-109. The frequency of oscillator V-110 is balanced out, therefore only the sum and differ-

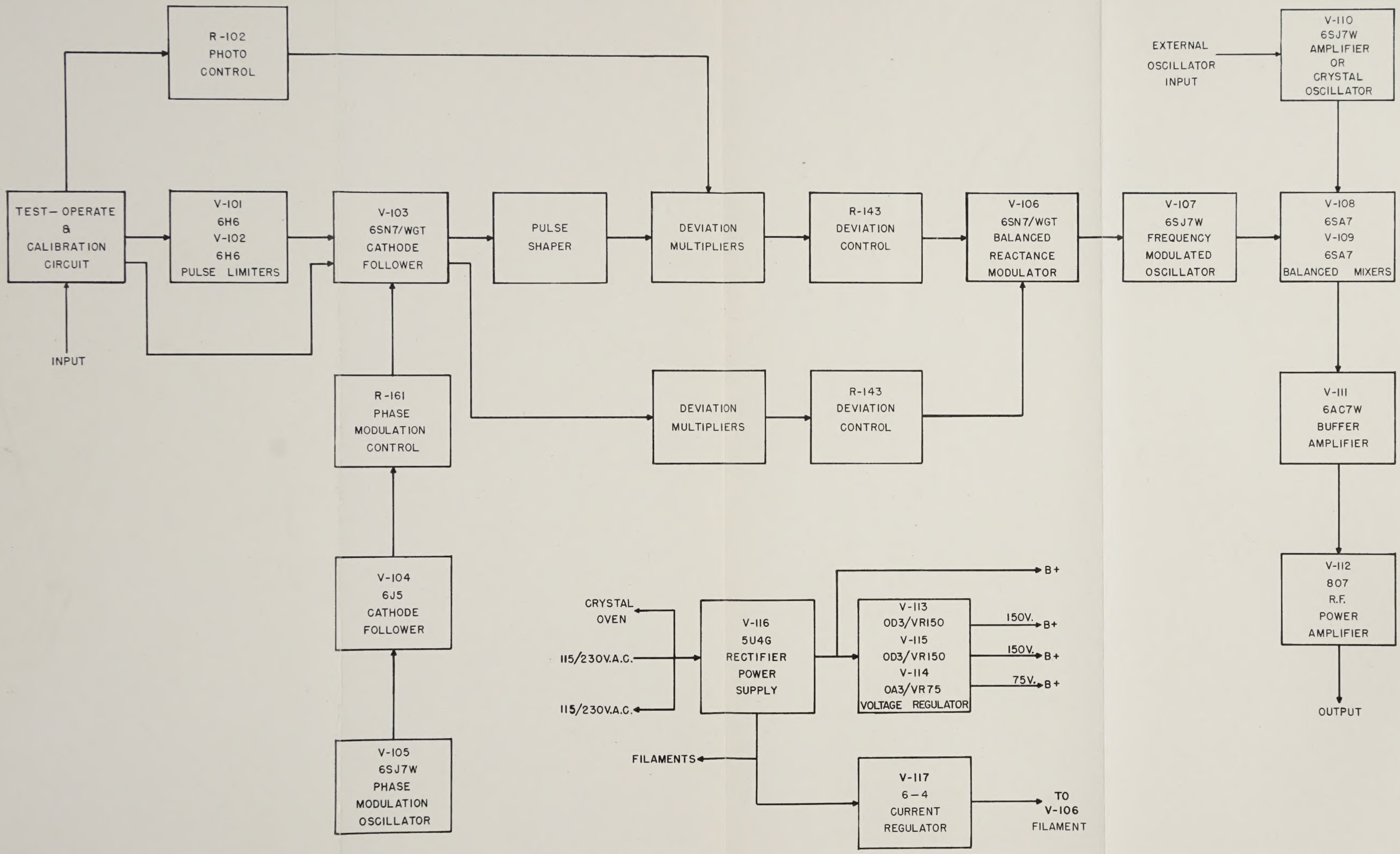

Figure 2–2. Functional Block Diagram

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ence frequencies resulting from the mixing of the two oscillator frequencies are present in the output of the balanced mixers. The plate circuits of the balanced mixers are tuned to the higher or sum frequency.

The main tuning tank of the 200-kc. oscillator (L-103 and C-116) and the crystals associated with the crystal oscillator are located in an oven whose temperature is closely regulated at 70°C.

The output of the balanced mixers is amplified in two stages consisting of a buffer amplifier V-111 and an R.F. amplifier V-112. The buffer amplifier permits a low output from the balanced mixers and increases the power of the wanted sideband. A ganged variable capacitor C-127, labeled TUNING, tunes the output of the crystal oscillator, balanced mixers, and the buffer amplifier. A variable capacitor C-150, labeled OUTPUT TUNING, tunes the plate circuit of the power amplifier. The plate circuit of the power amplifier includes an OUTPUT LEVEL control L-121 for matching the keyer output to the low impedance of the transmission line.

The tuned circuits of the crystal oscillator, balanced mixers, buffer and final amplifier are separated into three bands with ranges of 1 to 1.8 mcs., 1.8 to 3.5 mcs. and 3.5 to 6.7 mcs. Any one of the ranges may be selected by the FREQ. RANGE switch S-107.

The limiting circuit V-101 and V-102 operates on either a polar or neutral keying wave. The amplified positive pulses from the limiting stages are applied to a cathode follower V-103. The form of the output voltages from the cathode follower is modified by a series of waveshaping filters which are selected by the input FILTER switch S-103. See Figure 7–17. The signal may also be phase modulated at approximately 200 cycles by turning on the PHASE MODULATION switch S-105. The amount of phase modulation is varied by adjusting the PHASE MODULATION control R-161. Before being applied to the reactance modulator tube the output of the cathode follower circuit is connected to a point on a frequency divider selected by the MULTIPLIER switch S-104. The amount of frequency change of the 200-kc. oscillator depends upon the input from the balanced reactance modulator. The input is varied by the setting of the MULTIPLIER switch S-104 and DEVIATION control R-143. This variation allows for multipliers in the associated transmitter in order to maintain a constant frequency-shift at the output of the transmitter.

(2) PHOTO.–Photo operation is similar to FSK operation except that the limiting and waveshaping circuits are not utilized. A positive voltage from 0 to 20 volts of fixed polarity with the negative side grounded is applied to the frequency-shifting circuits through the PHOTO INPUT control, DEVIATION control and frequency dividers. The photo input voltage as observed on the panel meter M-101 is adjusted by the PHOTO INPUT control R-102. Refer to Figure 7–18 for typical waveforms.

b. CIRCUIT ANALYSIS.–The following subparagraphs discuss in detail the circuitry of the AN types KY-58/GRT and KY-75/SRT keyers. Both keyers are identical in electrical design therefore the following description is applicable to either unit. In general the discussion follows the outline presented in Figure 2–2, the functional block diagram.

(1) TEST-OPERATE AND CALIBRATE SWITCH.–The TEST-OPERATE and CALIBRATE switch is a five-position switch utilized to select the circuit arrangement required for frequency-shift or photo operation and the arrangement required to perform the alignment adjustments for carrier, mark and space.

(a) CARRIER.–In the carrier position the carrier condition is simulated locally in the keyer for alignment and calibration purposes. With the TEST-OPERATE switch in the carrier position a steady carrier signal is obtained by connecting the two grids of V-103 together and applying one-half the bias voltage of the limiter tube V-102 to these grids.

(b) SPACE.–In the 'Space' position the space condition is simulated in the keyer for alignment and calibration purposes. This is accomplished by removing the keying signal and thus placing the keyer in a non-keying state. As the fixed carrier voltage remains on the corrective grid (pin No. 4) of V-103, an unbalanced condition appears between the two grids thereby causing a deviation displacement from the carrier.

(c) MARK.–In the 'Mark' position the mark condition is simulated in the keyer for alignment and calibration purposes. This is accomplished by applying a steady Mark voltage to the limiter input.

(d) FREQUENCY-SHIFT.–With the switch in the 'FSK' position the equipment is placed in the 'ready for operation' condition with the key line circuits connected.

(e) PHOTO.–With the switch in the 'Photo' position the equipment is placed in the 'ready for operation' condition with the photo circuits connected.

(2) LIMITERS.–Two 6H6 twin-diode tubes, employed as double-diode limiters, are provided to furnish a modulating wave effectively isolated from amplitude and wave front variations of the incoming telegraph signal. See Figure 2-3 for a schematic diagram of this stage.

The d.c. telegraph voltage appearing across R-108 is applied to the first diode of V-101. The first diode section removes the negative pulses to reduce polar keying to on-off keying. The second diode

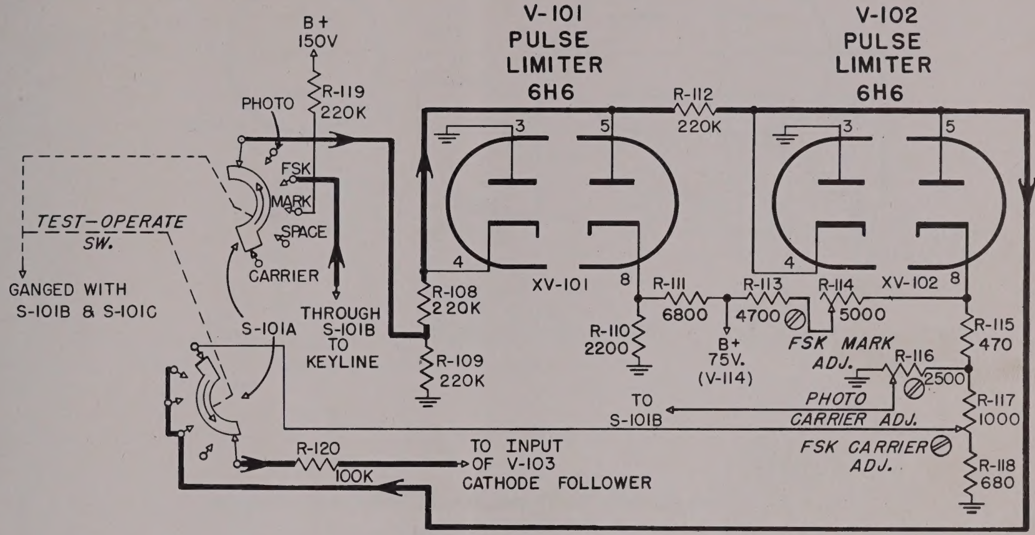


Figure 2–3. Limiter Stages, Simplified Schematic Diagram

section limits the positive pulse for on-off keying. The positive pulse limiting diode is biased by cathode resistor R-110 so that a 30-volt limiting threshold is obtained. Bias voltage for the positive pulse diode is supplied by voltage regulator V-114 through dropping resistor R-111. The limited positive pulses appearing across R-112 are applied to the second double-diode limiter where any remaining negative pulses are clipped by the first section of the diode and the positive pulses are limited by the second section of the diode. Bias voltage for the positive pulse limiter is supplied by voltage regulator V-114 through dropping resistor R-113 and variable resistor R-114. The 'FSK' Mark adjustment R-114 is adjusted to obtain a 2.5 volt change between space and mark as indicated on the panel meter.

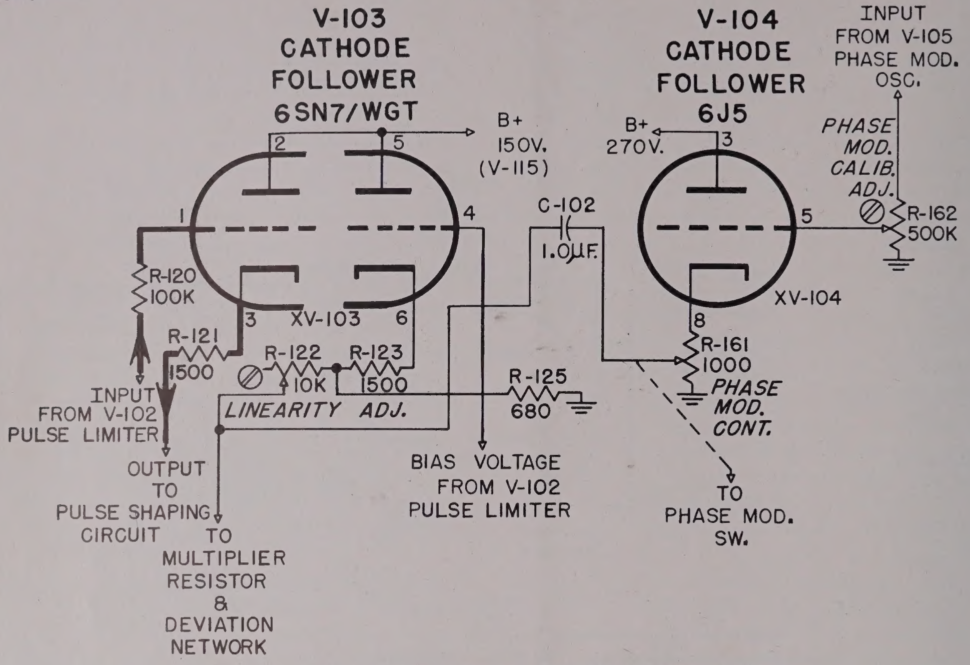


Figure 2–4. Cathode Follower Stages, Simplified Schematic Diagram

(3) CATHODE FOLLOWERS.–See Figure 2-4 for a schematic diagram of the two cathode follower stages.

(a) The second diode limiter is followed by a dual-triode cathode follower V-103, a type 6SN7/WGT tube. The cathode follower acts as an impedance transforming device to match the high impedance signal circuits to the relatively low impedance calibration circuits. A dual deviation control R-143A and R-143B (See Figure 2–8) is provided in the cathode circuits to obtain equal deviation voltages on the grids of the reactance modulator. LINEARITY adjustment R-122 is adjusted to equalize the gain of each section of the dual triode. The signaling triode section is not used during photo operation.

(b) Triode V-104, a type 6J5 tube, is employed as a cathode follower and acts as an impedance transforming device to match the high impedance output of the 200-cycle phase modulation oscillator to the low impedance phase modulation control circuit.

(4) PHOTO INPUT CONTROL.–See Figure 2-5 for a schematic diagram of the photo input circuit.

As the limiting and wave shaping circuits are not utilized during photo transmissions, the photo signal is applied to the PHOTO INPUT control R-102 whose input impedance is 600 ohms. The PHOTO INPUT control provides a means of adjusting the photo input voltage to a peak value of 5 volts before application to the frequency shifting circuits. The photo input voltage may be observed on the panel meter M-101 by setting the METERING switch S-102 at Input.

(5) PHASE MODULATION OSCILLATOR.–The phase modulation oscillator is switched into the circuit by use of the PHASE MODULATION switch S-105. However phase modulation is normally not used if the total frequency-shift between mark and space signals is less than 600 cycles-per-second or if the dotting speed is faster than 35 dot-cycles per second.

The phase modulation oscillator is a special type of resistance-capacity circuit employing a type 6SJ7W pentode tube V-105. See Figure 2–6 for a schematic diagram of this stage.

The resistance-capacity phase-shifting network composed of C-107, R-167, C-108, R-169, C-109 and R-170 is connected between the output and the input of the tube. The circuit is so proportioned to produce the proper phase relation between the grid and the plate of the tube in order to maintain oscillation. Variable resistor R-168 which is connected in the phase shifting network has a range of 40 cycles and is utilized to adjust the circuit to 200 cycles. The 200-cycle voltage is superimposed on the reactance modulator V-106. This 200-cycle voltage causes a

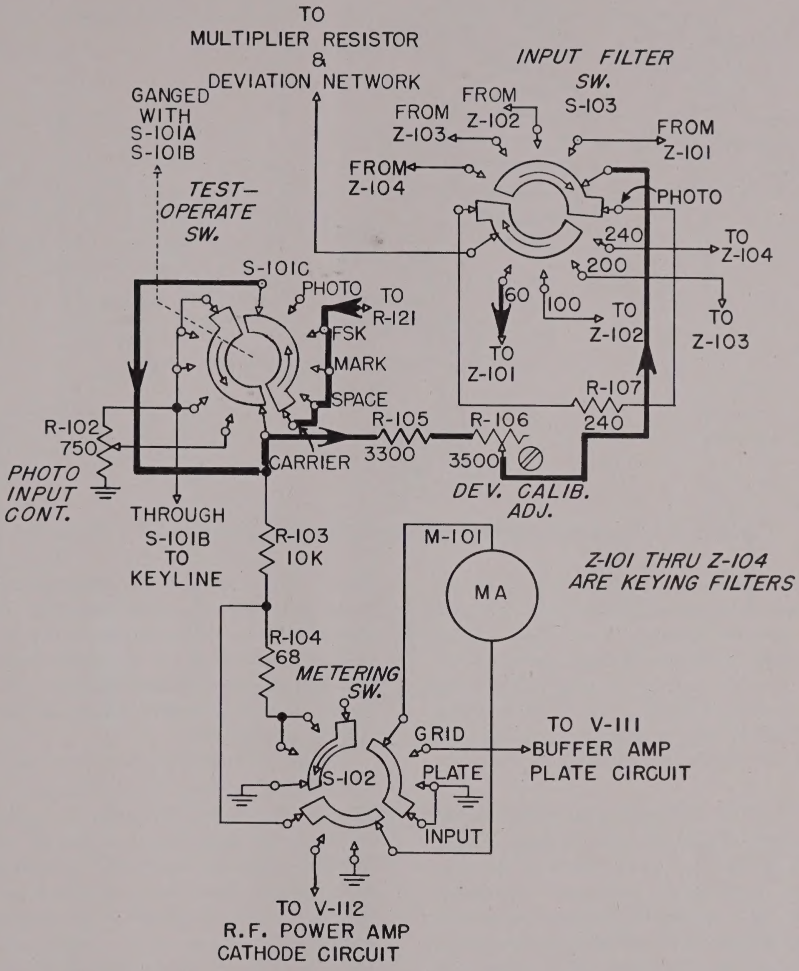


Figure 2–5. Photo Input Stages, Simplified Schematic Diagram

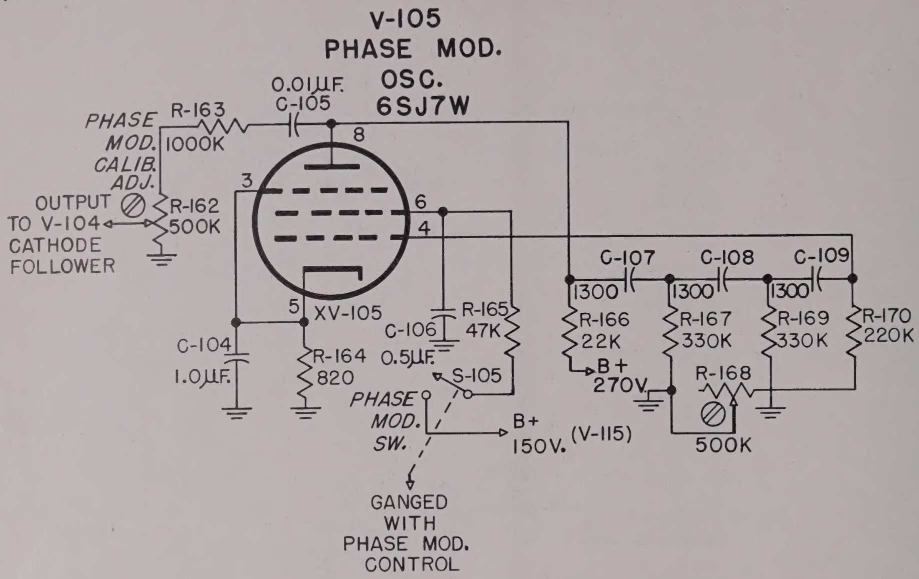


Figure 2–6. Phase Modulation Oscillator Stage, Simplified Schematic Diagram

phase shift which is adjustable from zero up to one radian and provides a means of reducing selective fading during adverse operating conditions. Plate voltage of the tube is supplied through plate load resistor R-166. Screen voltage is supplied through dropping resistor R-165 which is bypassed by capacitor C-106. Cathode bias is supplied through cathode resistor R-164 which is bypassed by capacitor C-104.

(6) PULSE SHAPER.–The frequency-shift signal transitions are wave-shaped to restrict sideband radiation by means of four low pass filters in the d.c. telegraph signal path to the reactance modulator. See Figure 2–7 for a schematic diagram of the low pass filters and Figure 7–17 for typical waveforms. The telegraph signal output of the limiting tube circuit is a series of square waves. If these square waves are rounded before being passed to the reactance modulator, there are fewer sidebands generated due to the partial elimination of the harmonic content of the square wave. The reduction of sidebands permits the assignment of closer radio-channel spacing for telegraph operation with the keyer.

Four low pass filters, capable of 30 db. attenuation to frequencies above the third harmonic of the keying speed, are used to accomodate a range of signaling speeds of 60, 100, 200 and 240 dot-cycles per second. The respective filter is selected by the five-position input FILTER switch S-103. The fifth position disconnects the filters during photo transmission. When switch S-103 is set at position 60, the filter provides a partial rounding of the square waves. The rounding of the waves is progressively less pronounced as the switch is turned to position 100 and then to position 200. In position 240 practically unmodified square waves are delivered to the reactance modulator.

(7) DEVIATION MULTIPLIERS AND DEVIATION CONTROLS.–During high-frequency transmission when the R.F. carrier frequency is multiplied by some factor in the transmitter, the amount of deviation of frequency shift is multiplied simultaneously by the same factor. Therefore it becomes necessary to reduce the amount of deviation by a factor equal to the multiplication factor of the transmitter. This is accomplished by the MULTIPLIER switch S-104 which provides a means of dividing the frequency deviation by a factor of 1, 2, 3, 4, 6, 8, 9 or 12, thereby keeping the deviation at its preset amount regardless of the frequency multiplication employed in the transmitter. See Figure 2–8 for a schematic diagram of these stages. The deviation division is obtained by the use of a voltage divider network of series-shunt connected non-inductive precision resistors in conjunction with the MULTIPLIER switch S-104. The voltage divider network is so arranged that as the amount of deviation is divided a small resistance is shunted across the Deviation control and a large resistance is placed in series with the control thereby holding the waveshaping filter termination at 5000

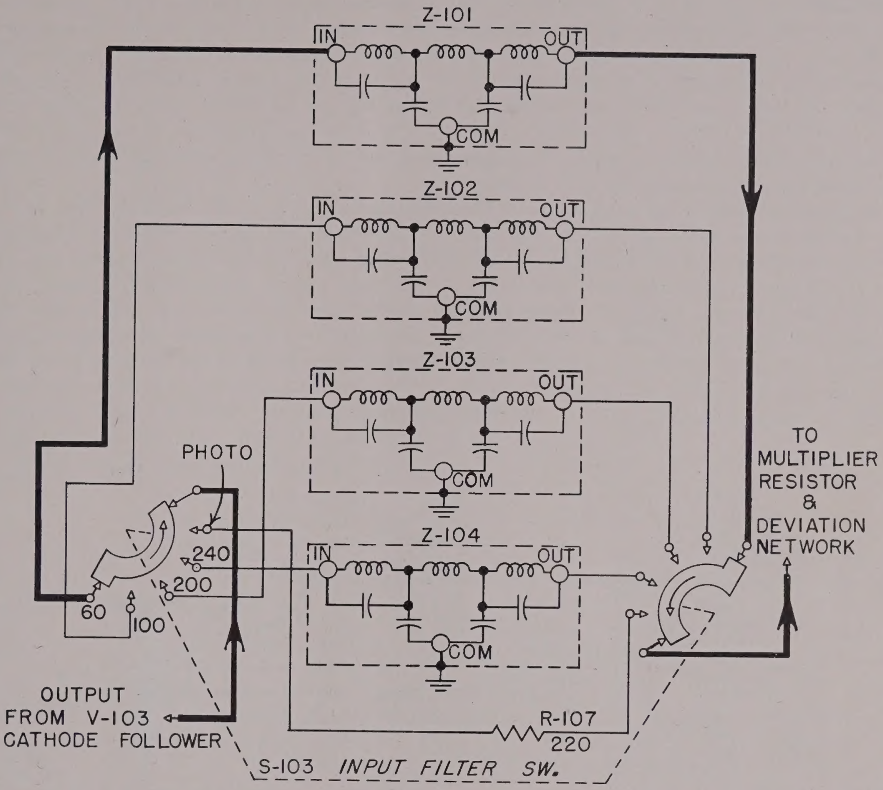


Figure 2–7. Pulse Shaper Stage, Simplified Schematic Diagram

ohms and reducing the deviation by a factor equal to the multiplication factor of the transmitter. As the amount of deviation is lowered a converse action takes place i.e., a large resistance shunts the control and a small resistor is placed in series. By reducing the shift in this manner the mean carrier frequency will be corrected to maintain its center position between Space and Mark as the multiplication factor or deviation is altered. The calibrated dial of the Deviation control reads the actual amount of deviation realized at the output of the transmitter.

The keyer is designed for a frequency-shift which is adjustable from 0 to 1000 cycles for FSK operation and any value between 0 and 2000 cps., i.e., 0 to ±1000 cps. with respect to the assigned frequency for photo transmission. For the purpose of this description, assume that the keyer is used with a radio circuit in which there is a total frequency-shift of 850 cycles between marking and spacing signals. However, the actual frequency shift necessary at the output of the frequency shift keyer unit depends upon the frequency multiplication factor of the associated transmitter, as shown in the following table:

Transmitter Frequency Multiplication	Frequency Shift at Keyer Output	Ratio with respect to 425 cycles
1	425 cycles	1/1
2	212-1/2 cycles	1/2
3	141-2/3 cycles	1/3
4	106-1/4 cycles	1/4
6	70-5/6 cycles	1/6
8	53-1/8 cycles	1/8
9	47-2/9 cycles	1/9
12	35-5/12 cycles	1/12

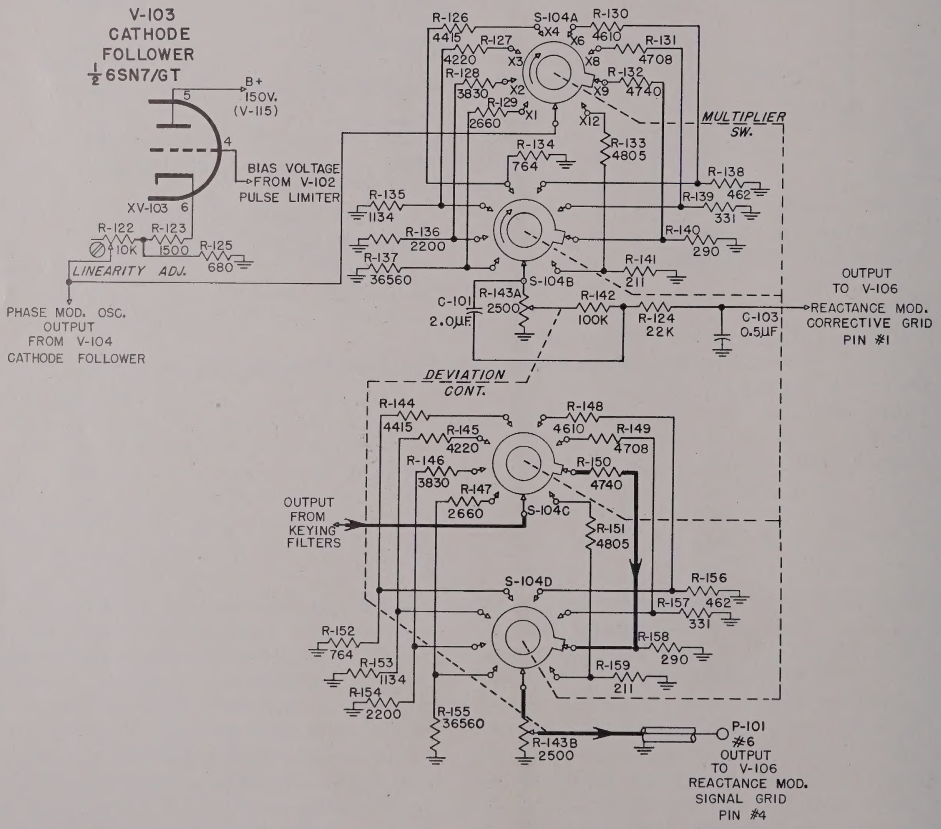


Figure 2-8. Deviation Multipliers and Deviation Controls, Simplified Schematic Diagram

In normal operation the DEVIATION control is adjusted to obtain the desired deviation as read directly on the calibrated dial of the control. After the multiplication factor employed in the transmitter is determined, the MULTIPLIER switch is set at a position corresponding to this factor. In this manner the amount of deviation is determined and held constant despite any ensuing multiplication in the transmitter.

(8) 200 KC. OSCILLATOR.–The low frequency oscillator employs a type 6SJ7W sharp cut-off pentode V-107 in an essentially balanced circuit. See Figure 2–9 for a schematic diagram of this stage. The oscillator operates at 200 kcs. and is heterodyned to the operating frequency by means of a crystal oscillator V-110 and a balanced mixer V-108 and V-109. The main tuning tank of the oscillator and the grid-cathode capacitor C-115 of V-106 are temperature controlled in the oven. Inductor L-103 is adjusted to provide a 200-kc. output when the CARRIER CALIBRATE control dial C-114 is set at its mid-position. L-103 is factory adjusted and ordinarily does not require readjustment in the field. The CARRIER CALIBRATE control is provided in the cathode circuit of the oscillator to permit slight readjustment of the carrier to compensate for minor differences in crystals and/or tubes. R-177 is utilized as a grid leak resistor. Screen voltage is obtained from voltage regulator V-113 through dropping resistor R-178 which is bypassed by C-160. Plate load resistor R-179 is decoupled by C-118. Resistors R-180 and R-179 form the balanced plate load. The 200-kc. oscillator output is fed through coupling capacitor C-119 to the permeability tuned tank circuit L-104 and C-121. Inductor L-104 is normally tuned for maximum output.

The 200-kc. oscillator is frequency-modulated by reactance modulator V-106. The frequency-modulated 200-kc. oscillator output amplitude modulates the R.F. carrier.

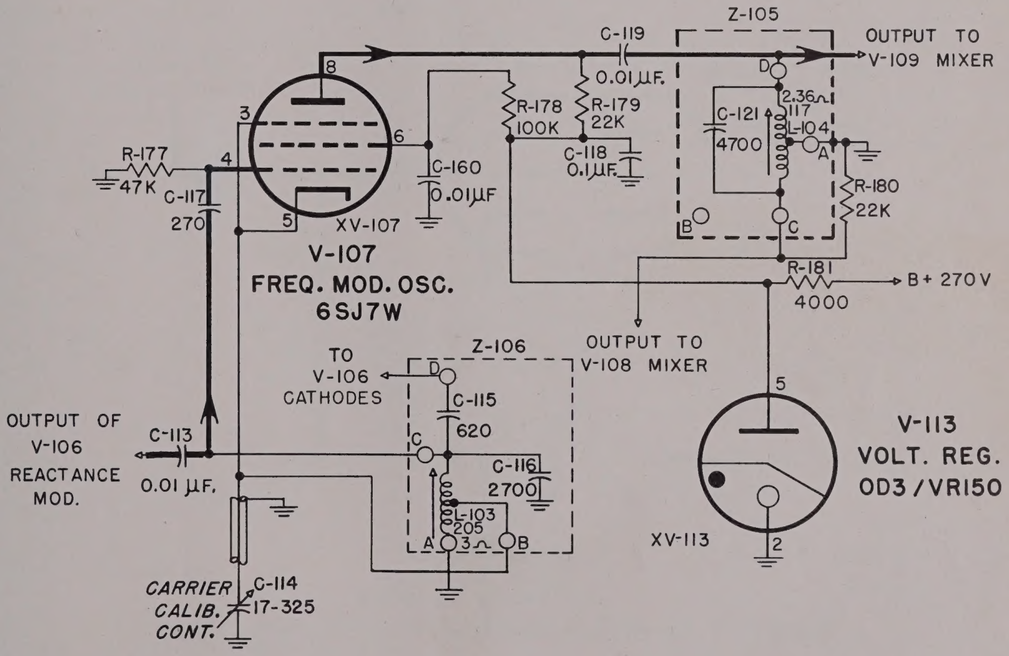
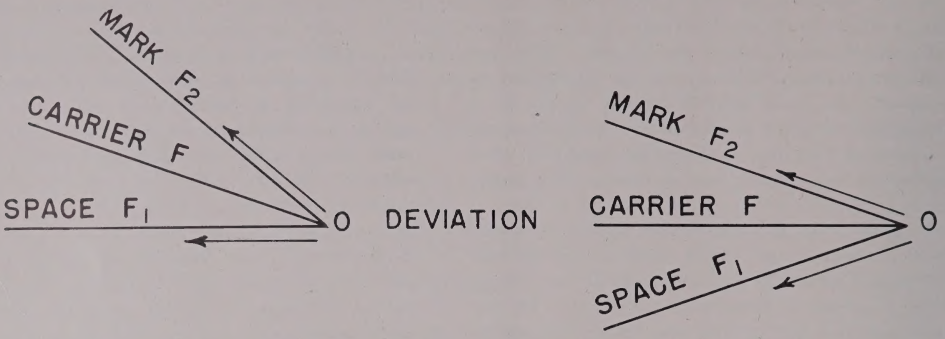


Figure 2–9. 200-Kilocycle Oscillator Stage, Simplified Schematic Diagram



NO DEVIATION CORRECTION CIRCUIT.

DEVIATION CORRECTION CIRCUIT.

Figure 2–10. Vector Diagrams Showing the Effects of Deviation Variation on Carrier Placement

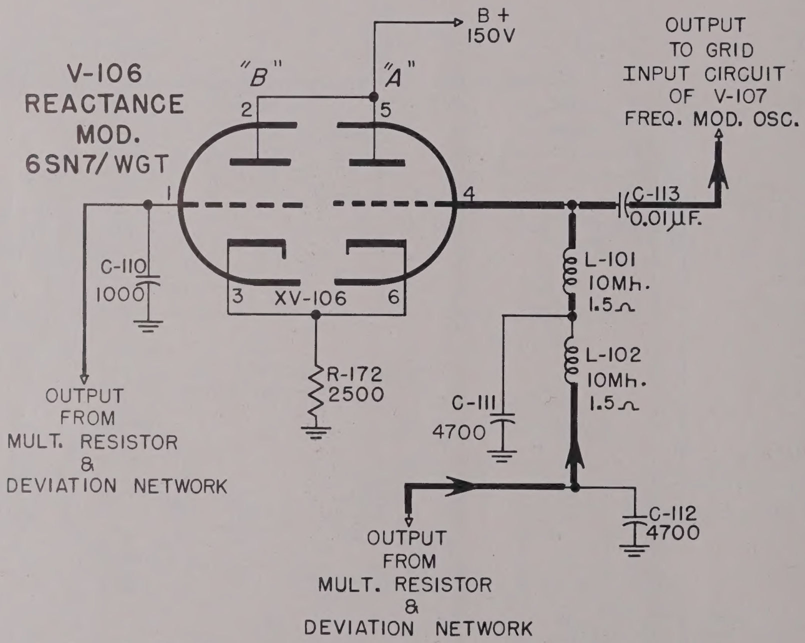


Figure 2–11. Reactance Modulator Stage, Simplified Schematic Diagram

(9) REACTANCE MODULATOR.–During frequency shift operation a Mark voltage of approximately eight volts appears on the signal grid (pin No. 1) of cathode follower V-103. A fixed D.C. voltage of approximately four volts, which is equivalent to the average carrier voltage, is connected from voltage regulator V-114 to the corrective grid (pin No. 4) of cathode follower V-103 through the FSK Carrier Adjustment R-117. The corrective voltage is connected to the corrective grid (pin No. 1) of the reactance modulator V-106 through one section of the corrective network consisting of a voltage divider system in conjunction with Multiplier switch sections S-104A, S-104B and one section of the dual Deviation control

R-143A. The signal voltage is connected to the signal grid (pin No. 4) of the reactance modulator through a keying filter and the other section of the corrective network consisting of a voltage divider system in conjunction with Multiplier switch section S-104C, S-104D and one section of the dual Deviation control R-143B.

The correction circuit is necessary in order to maintain equal voltages on both grids of the reactance modulator as the deviation is increased from zero. As the deviation is increased the zero (space) signal frequency will decrease to the correct space value. When the Multiplier switch S-104 and the Deviation control R-143 are varied the voltage on the corrector grid (pin No. 1) of the reactance tube is kept equal to the average carrier value of the signal grid (pin No. 4) of the reactance tube. By controlling the circuit in this manner the deviation can be changed without readjusting the carrier, whereas in a non-corrected deviation circuit the carrier will shift between the Mark and Space frequencies with changes in deviation, necessitating retuning of the carrier.

Figure 2–10 is a vector diagram illustrating the effect on carrier placement with changes in deviation in both corrected and non-corrected deviation circuits.

This stage employs a type 6SN7/WGT dual-triode tube V-106 as a balanced variable reactance modulator. See Figure 2–11 for a schematic diagram of this stage. The use of a balanced modulator minimizes variation of the mean frequency and also allows the shift to be varied without affecting the mean carrier frequency. The reactance modulator functions as an amplifier whose input capacity can be varied by changing the amplifier gain and consequently changes the 200-kc. oscillator frequency accordingly. Section A of V-106 (consisting of triode section 4,5 and 6) is a cathode follower type amplifier and section B of V-106 (consisting of triode section 1, 2 and 3) functions to control the gain of section A in accordance with the voltage on the grid of section B. The input of the cathode follower amplifier is made to look capacitive by connecting capacitor C-115 between the input (the grid) and the output (the cathode). In the no-signal condition the cathode would be essentially at ground RF potential and the input capacity would appear to be C-115. If the amplifier were unity gain the cathode and grid would be at the same R.F. voltage and phase. In this condition capacitor C-115 would have no potential difference between its terminals and would appear as though it had been removed from the circuit. The amplifier input capacity would in this case appear to be that due to the tube capacities alone. Since the cathode follower gain always ranges between 0 and 1, corresponding percentages of C-115 appear to be connected across the 200-kc. oscillator circuit and consequently change its frequency accordingly. Actually the cathode follower gain is controlled by the bias on the grids of sections A and B.

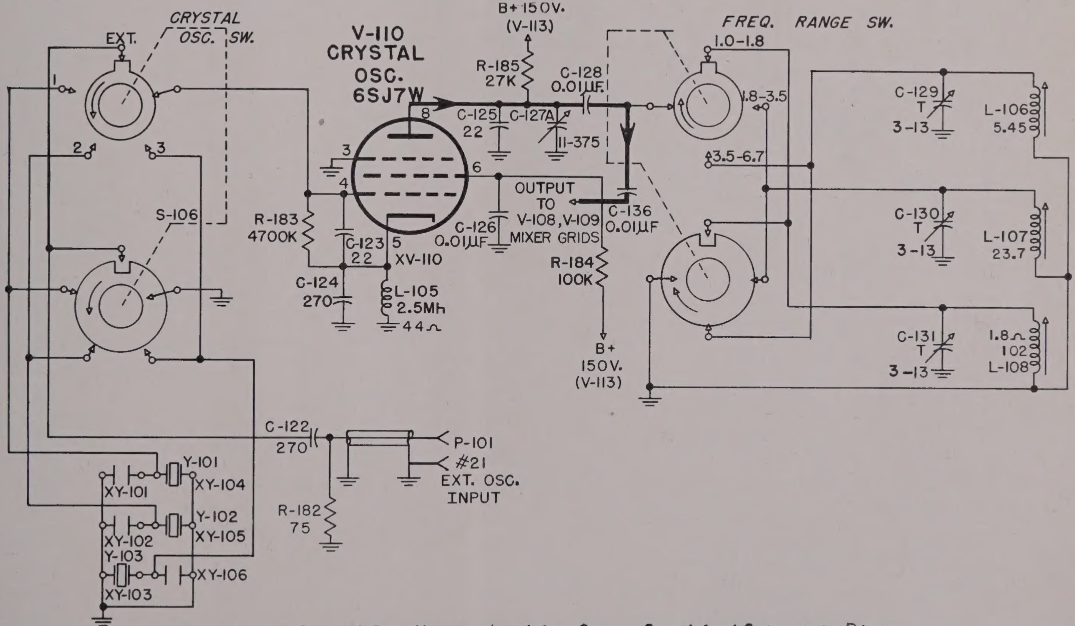


Figure 2–12. Crystal Oscillator - Amplifier Stage, Simplified Schematic Diagram

(10) CRYSTAL OSCILLATOR-AMPLIFIER.—The crystal oscillator is a voltage-regulated, electron-coupled type employing a type 6SJ7W pentode tube V-110. When an external oscillator is employed, the crystal oscillator tube functions as a pentode amplifier. See Figure 2-12 for a schematic diagram of this stage.

The oscillatory circuit employs the grid, cathode and screen of the tube. The resultant oscillation is coupled to the plate circuit via the tube's electron stream. A tuned circuit made up of inductor L-105 and C-124 is placed in the cathode. This tuned circuit is designed so as to obtain the proper R.F. potential in the cathode relative to the grid and screen so that oscillation will result. The cathode potential is obtained in a voltage divider circuit composed of the tube's grid-to-cathode circuit capacity in series with the cathode-to-chassis tuned circuit impedance at the oscillating frequency. The crystal comprises the main tank circuit across which these impedances are shunted. Due to the fact that the resonant frequency of the cathode tuned circuit is lower than the crystal frequencies used, the cathode-to-chassis circuit presents a capacitive reactance at the crystal frequency, thus completing the capacity voltage divider across the crystal. The output of the oscillator is applied through coupling capacitors C-128 and C-136 to the control grids of the balanced mixer tubes V-108 and V-109.

(11) BALANCED MIXERS.—The mixer employs two type 6SA7 pentagrid tubes V-108 and V-109 in a balanced circuit. See Figure 2—13 for a schematic diagram of this stage. The balanced mixers and crystal oscillator heterodyne the 200-kc. frequency-shift oscillator to the operating frequency. In the balanced type mixer, the crystal oscillator frequency is balan-

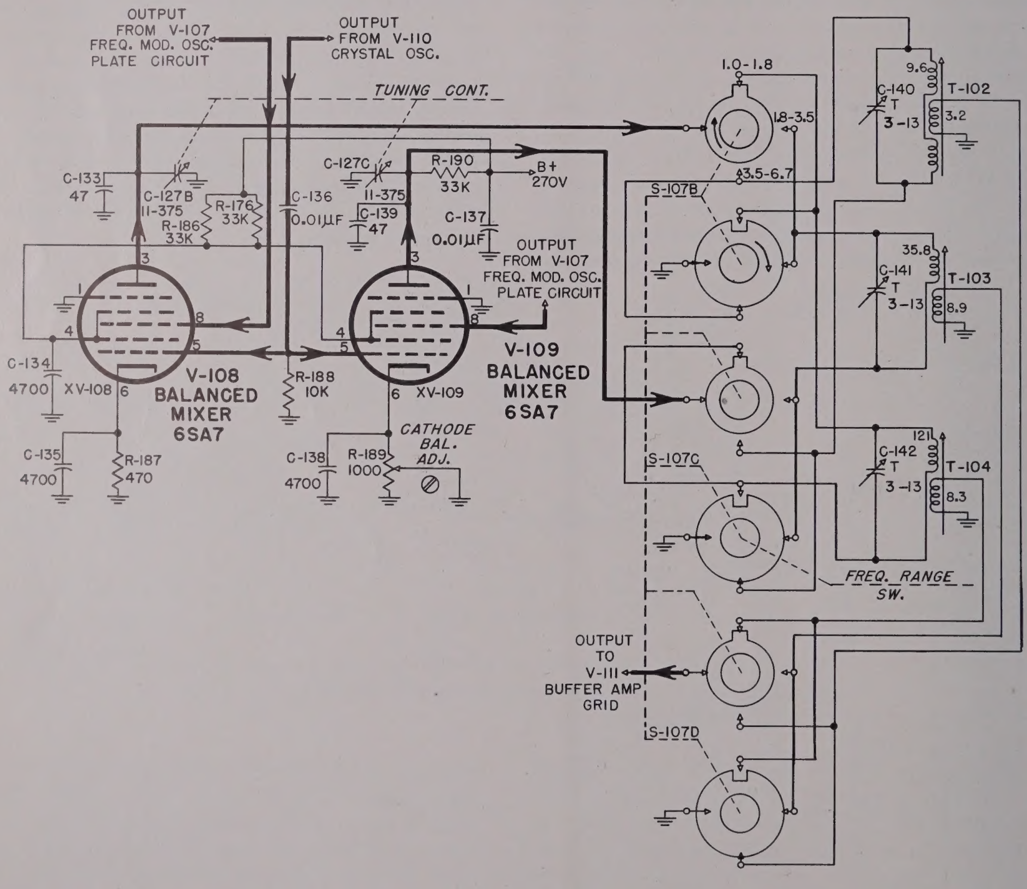


Figure 2—13. Balanced Mixer Stages, Simplified Schematic Diagram

ced out by adjusting the CATHODE BALANCING ADJUSTMENT R-189 to equalize the R.F. carrier components of tubes V-108 and V-109 which are 180° out of phase. Resistor R-189 is bypassed by capacitor C-138. Cathode resistor R-187 is bypassed by capacitor C-135. The platecircuits of the mixer tubes are tuned by sections B and C of TUNING capacitor C-127. Inductors T-102, T-103, T-104 with trimmer capacitors C-140, C-141,and C-142 are selected respectively by the FREQ. RANGE switch S-107 to complete the mixer tuned circuits. With proper balancing of the cathode circuits, tuning of the plate circuit will produce a minimum amount of grid drive when tuned to the oscillator frequency. The sum and difference frequencies resulting from mixing the input radio frequency and the 200-kc. oscillator frequencies are present in the output of the balanced mixers. The combined output of the balanced mixers is tuned to the higher or sum frequency.

(12) BUFFER AMPLIFIER.—The output of the balanced mixer is applied to the grid of a 6AC7W sharp cut-off pentode V-111. See Figure 2–14 for a schematic diagram of this stage.

The buffer amplifier stage permits a lighter loading of the mixer output circuit which, together with the added tuned circuit, provides greater discrimination against unwanted modulation components. The output of the balanced mixer is connected to the grid of tube V-111. Screen voltage is supplied through dropping resistor R-195 which is bypassed by C-143. The plate circuit of the amplifier is tuned by TUNING capacitor section C-127D. Inductors L-113, L-114 and L-115 with trimmer capacitors C-146, C-147 and C-148 are selected respectively by the FREQ. RANGE switch S-107 to complete the buffer tuned circuits.

(13) FINAL AMPLIFIER.—The power amplifier utilizes an 807 beam power amplifier tube V-112 connected as a class 'C' amplifier. See Figure 2–15.

Amplified signal voltages appearing at the output of the buffer amplifier are applied through capacitor C-145 to the grid of V-112. Screen voltage is supplied through dropping resistor R-198 which is bypassed by capacitor C-152. Cathode resistor R-197 is bypassed by capacitor C-149 to provide self bias. Panel meter M-101 is connected in the grid and plate

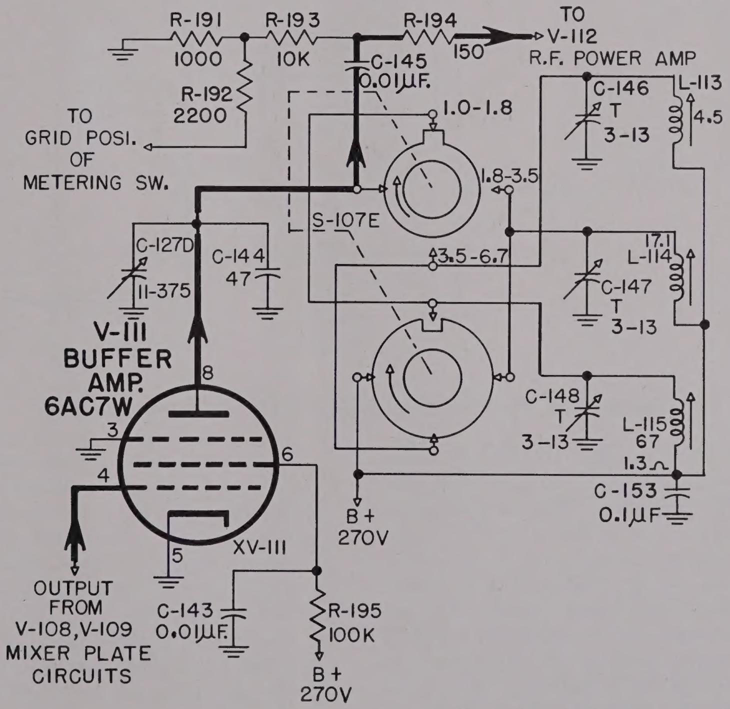


Figure 2–14. Buffer Amplifier Stage, Simplified Schematic Diagram

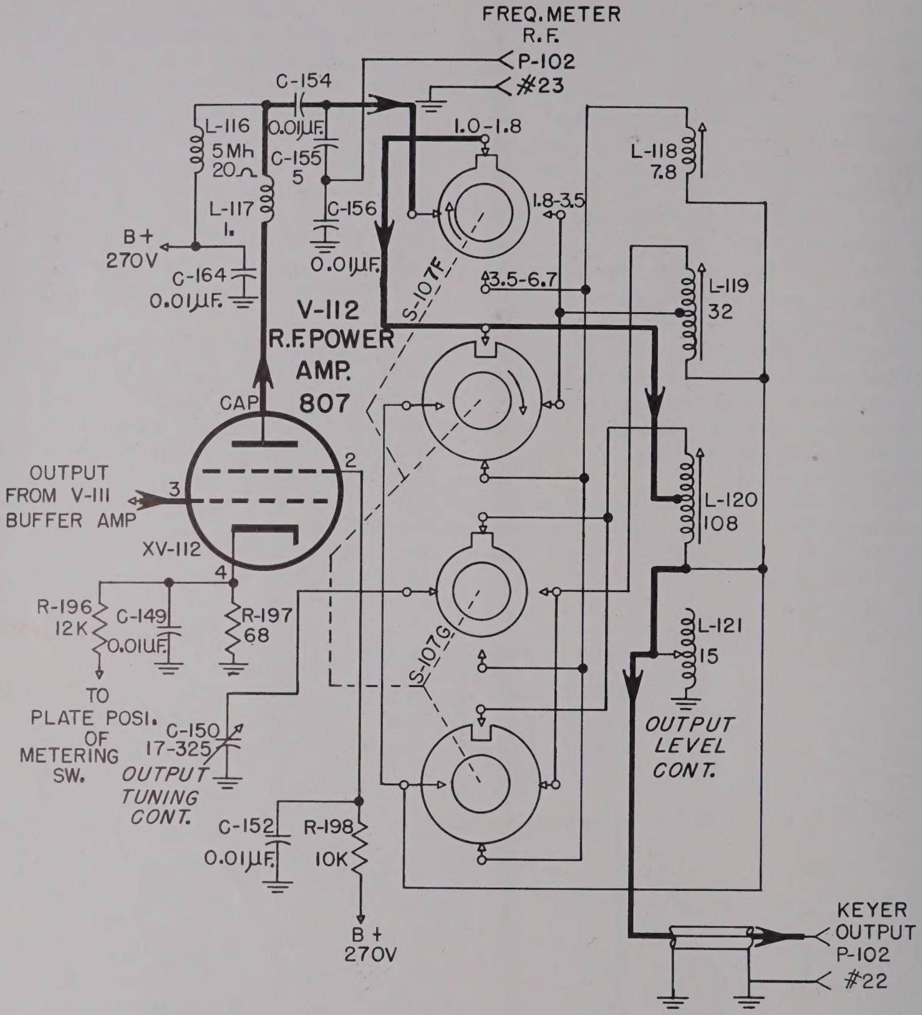


Figure 2–15. Final Amplifier Stage, Simplified Schematic Diagram

circuits through panel mounted METERING switch S-102 to give a visual indication of the grid and plate current of the final amplifier. The plate circuit of the final amplifier is tuned by the OUTPUT TUNING control C-150. Inductors L-118, L-119, L-120 are selected respectively by the FREQ. RANGE switch S-107 to complete the final tuned circuits. The output of the final amplifier is coupled to the OUTPUT LEVEL control L-121 to match the keyer output to the low impedance of the transmission line. The R.F. output is extended to the KEYER OUTPUT coaxial jack J-111 and then via cable assembly to the associated radio transmitter.

A capacity voltage divider comprising capacitors C-155 and C-156 is connected to ground from the plate circuit of V-112. A connection is made from a low-voltage point between the two capacitors to the Frequency Meter R.F. jack J-110 to permit application of a small amount of R.F. output to frequency-measuring equipment.

(14) POWER SUPPLY.—A built-in power supply designed to operate from a 115 or 230-volt A.C., single phase, 60-cycle source of supply is contained in the Modulator-Power Supply MD-165/URT. See Figure 2—16 for a schematic diagram of this stage.

The A.C. input is connected to the keyer by way of

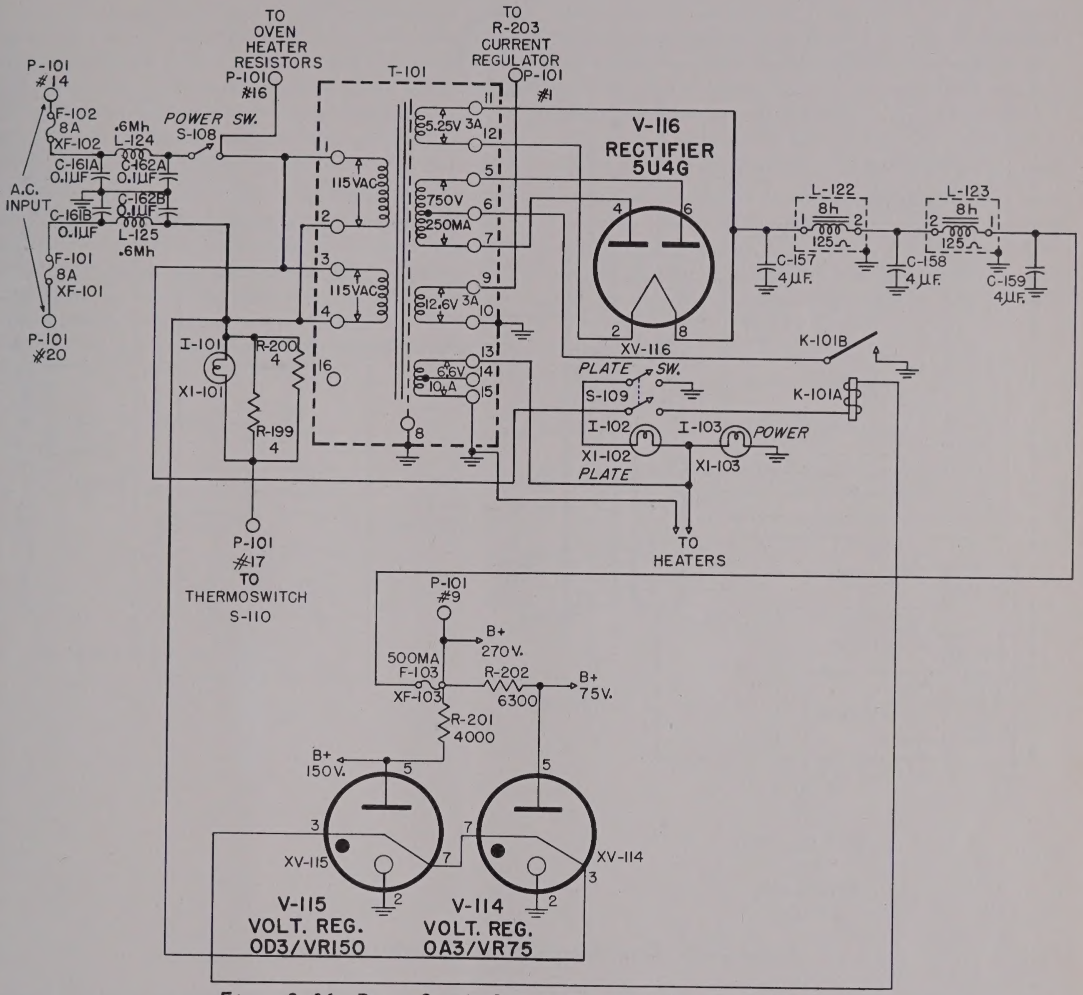


Figure 2-16. Power Supply Circuit, Simplified Schematic Diagram

the A.C. receptacle J-103 which is located on the blister assembly. The A.C. input is connected through the contacts of POWER switch S-108 and a line filter consisting of C-161A, C-161B, C-162A, C-162B, L-124 and L-125 to the primary of power transformer T-101 and to the controlled heaters of the crystal oven. A white jeweled pilot lamp I-103 lights when the POWER switch is at ON.

The power supply is wired at the factory for 115-volt operation, but minor wiring changes will permit 230-volt operation. It will be noted that for 115-volt operation the two primary windings of transformer T-101 and the oven heater resistors are all connected in parallel across the A.C. input. For 230-volt operation the two transformer windings and the four heater resistors are connected in series.

All D.C. voltages and filament voltages required by the keyer are furnished by the power supply as follows:

(a) 270 V.D.C. at 220 ma.

(b) 4.35 amperes at 6.3 V.A.C.

(c) 0.6 amperes at 12.0 V.A.C.

(d) 3 amperes at 5.0 V.A.C.

A 5U4G full-wave rectifier V-116, power transformer T-101 and a capacitor-input filter network consisting of C-157, L-122, C-158, L-123 and C-159 constitute the power supply circuit. Two eight-ampere line fuses and a 500-ma. B+ fuse are provided to prevent

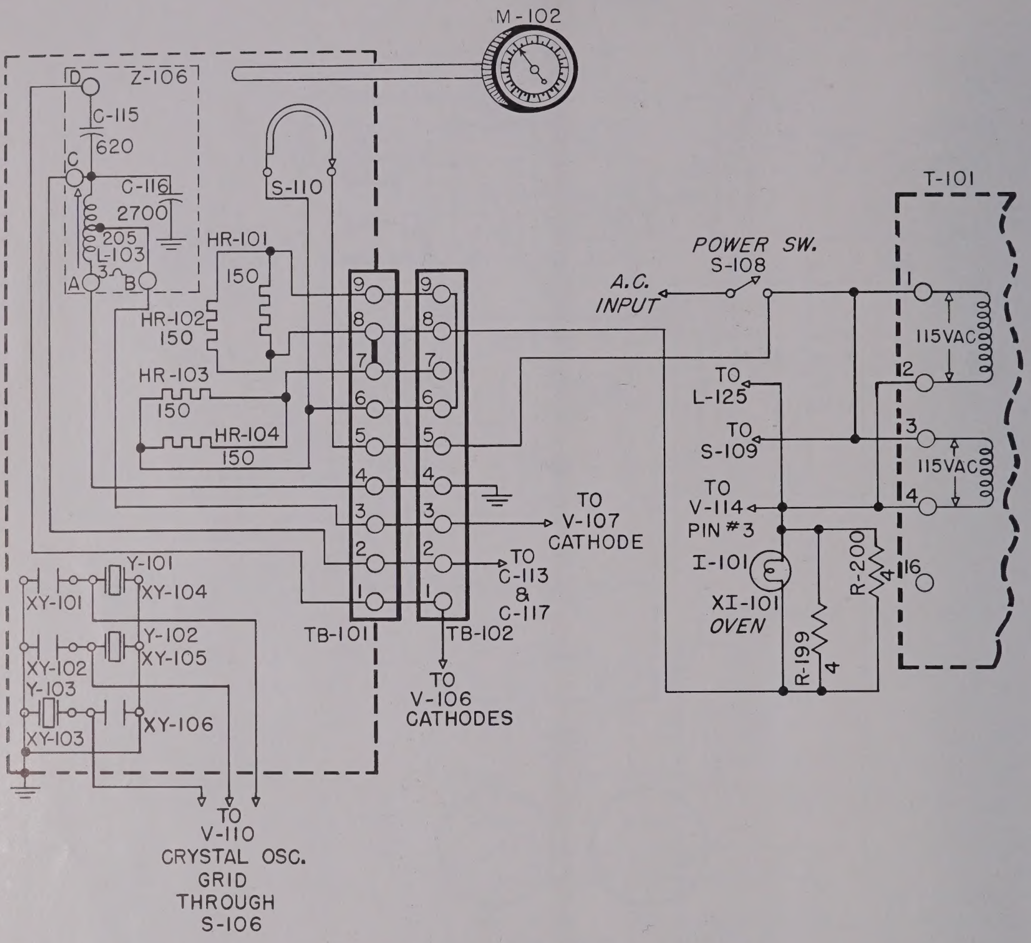


Figure 2–17. Crystal Oven, Simplified Schematic Diagram

damage to the equipment due to excessive line surges or B+ overload.

A single-contact, normally open relay K-101 is provided in the B minus circuit of the power transformer. When PLATE switch S-109 is closed, the A.C. circuit is completed to the primary of T-101 illuminating the red-jeweled pilot lamp I-102 and energizing relay coil K-101A. When relay coil K-101A becomes energized, relay contact K-101B closes thereby completing the B minus circuit.

Three voltage regulated stages employing two type OD3/VR150 and one type OA3/VR75 voltage regulator tubes are employed to prevent any instabilities due to voltage variations. A current regulator R-203, a type 6-4, is utilized to regulate the filament current of the reactance modulator.

R-203 consists of an iron wire hermetically sealed in a standard T9 envelope containing hydrogen or helium gas, the two gases with the highest heat conductivity. Its regulating action is based on:

(a) The high temperature coefficient of resistance of the iron wire which causes very large variations in resistance for relatively small changes in current through it.

(b) The very rapid cooling of the gas which flattens or extends the regulating characteristic.

(15) CRYSTAL OVEN.—The crystal oven, schematically shown on Figure 2–17, is provided to assure a minimum of frequency drift in the R.F. oscillator and 200-kc. oscillator. The oven is composed of four plaque heater resistors, HR-101, HR-102, HR-103 and HR-104 insulated from the outer oven walls by strips

of asbestos. The oven contains the crystal holders, 200-kc. oscillator tank circuit and the cathode-to-grid capacitor of the reactance modulator. The temperature of the oven is controlled by a thermoswitch S-110. The heater resistors are wired at the factory for 115-volt operation but minor wiring changes will permit 230-volt operation. The contacts of thermoswitch S-110 are normally closed except when the temperature of the oven is at 70°C. The contacts open and close intermittently to maintain the temperature at this level. A -50°C to +100°C thermometer and an amber jewel pilot lamp I-101 are utilized as oven temperature indicators. The lamp will remain lighted until the temperature of the oven has reached 70°C as indicated on the oven thermometer. When no heat is being applied the lamp will remain off until the oven temperature drops slightly below 70°C. The arrangement of oven heaters provides a constant temperature but not an extremely rapid warmup. The rate of temperature rise is approximately 3 degrees per minute. The temperature coefficient of the low-frequency oscillator tank mounted in the oven is approximately 3 cycles per degree. The total carrier drift using a one-megacycle crystal has been measured to be less than 5 cycles due to temperature after the oven is fully stabilized. However, the time required to stabilize may be an hour or more when the equipment has been left for long intervals at low ambient temperatures. The total oven heat is 305 watts.

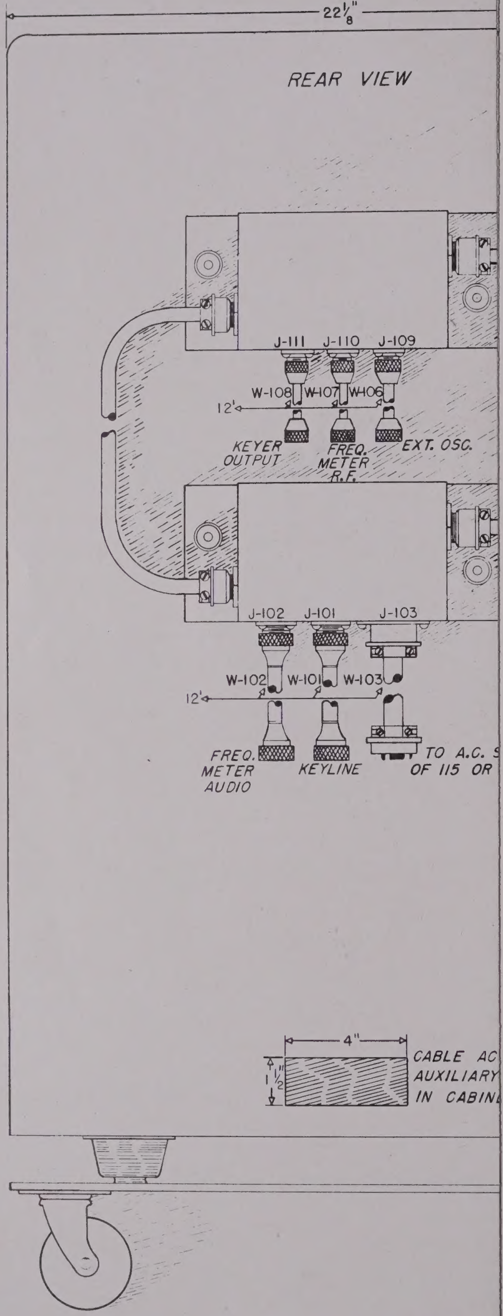


Figure 3-1. Keyer KY-58/GRT, Dimens

SECTION 3
INSTALLATION

1. UNPACKING.

The Keyers KY-58/GRT or KY-75/SRT and equipment repair parts are carefully packed in separate wooden crates for overseas shipment. One set of cables is provided with the KY-58/GRT. No cables are supplied with the KY-75/SRT but all connectors required to make up the necessary cables are provided. Two instruction books are shipped with the equipment. The equipment is contained in moisture-proof barrier cartons having an 18 months supply of Silica Gel. Do not open the cartons until the equipment is being installed, as the Silica Gel will saturate rapidly upon exposure to humid atmosphere. The recommended procedure to employ in unpacking each piece of equipment is as follows.

Step 1. Cut the metal straps around the crate and remove the side that reads 'Open This Side'. The cover is secured by nails and an ordinary nail puller or claw hammer may be employed.

Step 2. Remove sufficient filler material from the crate to permit access to the carton. Lift out the packaged items.

Step 3. Remove the outer water-proof wrapper and remove the outer carton.

Step 4. Cut the moisture-vaporproof barrier along the heat-sealed seam and remove the barrier.

Step 5. Open the inner carton and remove the dessicant.

Step 6. Lift the equipment out of the carton.

Step 7. Inspect the equipment for any damage incurred during shipment.

Step 8. The equipment spare parts set is packed in a manner similar to the keyer and its unpacking will follow the procedure outlined above in steps 1 through 7.

Step 9. The packing crates and packing material should be saved in event the equipment has to be repacked and shipped at a later date.

2. INSTALLATION.

Both units of the keyer are designed for mounting in the cabinet furnished for this purpose. Both sub-units may, however, be mounted in any standard 19-inch rack panel. When this is done it will be necessary to secure the blister assembly to the units. This is accomplished by means of the four 10-32" screws packed in the equipment repair parts box. Thread the screws through the opening in the head of the captive thumb screws at each side of the blisters until they are securely engaged into the chassis.

WARNING

> Voltages employed in the associated transmitter are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment. NEVER MEASURE POTENTIALS IN EXCESS OF 1000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

a. POSITIONING OF CABINET.

(1) KY-58/GRT.—When determining the location of the cabinet make sure that a minimum access space of approximately two feet is provided at the rear of the cabinet or the location is such that the cabinet may be rolled forward to permit access to the back. See Figure 3–1 for a dimensional drawing. This is adequate space for servicing (removal of blisters). Place the cabinet CY-1132/GRT in that part of the room where the temperature will be more or less constant i.e. not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter. Cables furnished for connections to the transmitter and other external equipment are 12 feet long.

(2) KY-75/SRT.—When mounting the KY-75/SRT cabinet CY-1133/SRT atop an operating table or bench allow sufficient space at the rear of the cabinet to permit access to the blister units. See Figure 3–2 for a dimensional outline drawing. Place the cabinet in that part of the room where the temperature will be more or less constant i.e., not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter.

b. ARRANGEMENT OF UNITS.—The blank panel in the bottom section of Keyer KY-58/GRT may be removed in the event it is desired to mount other equipment in the cabinet. Make sure that all mounting screws are turned tightly into place.

c. INSTALLATION OF CRYSTALS.—Crystals for operation of the keyer are not supplied by the contractor. Crystals for equipment operation are furnish-

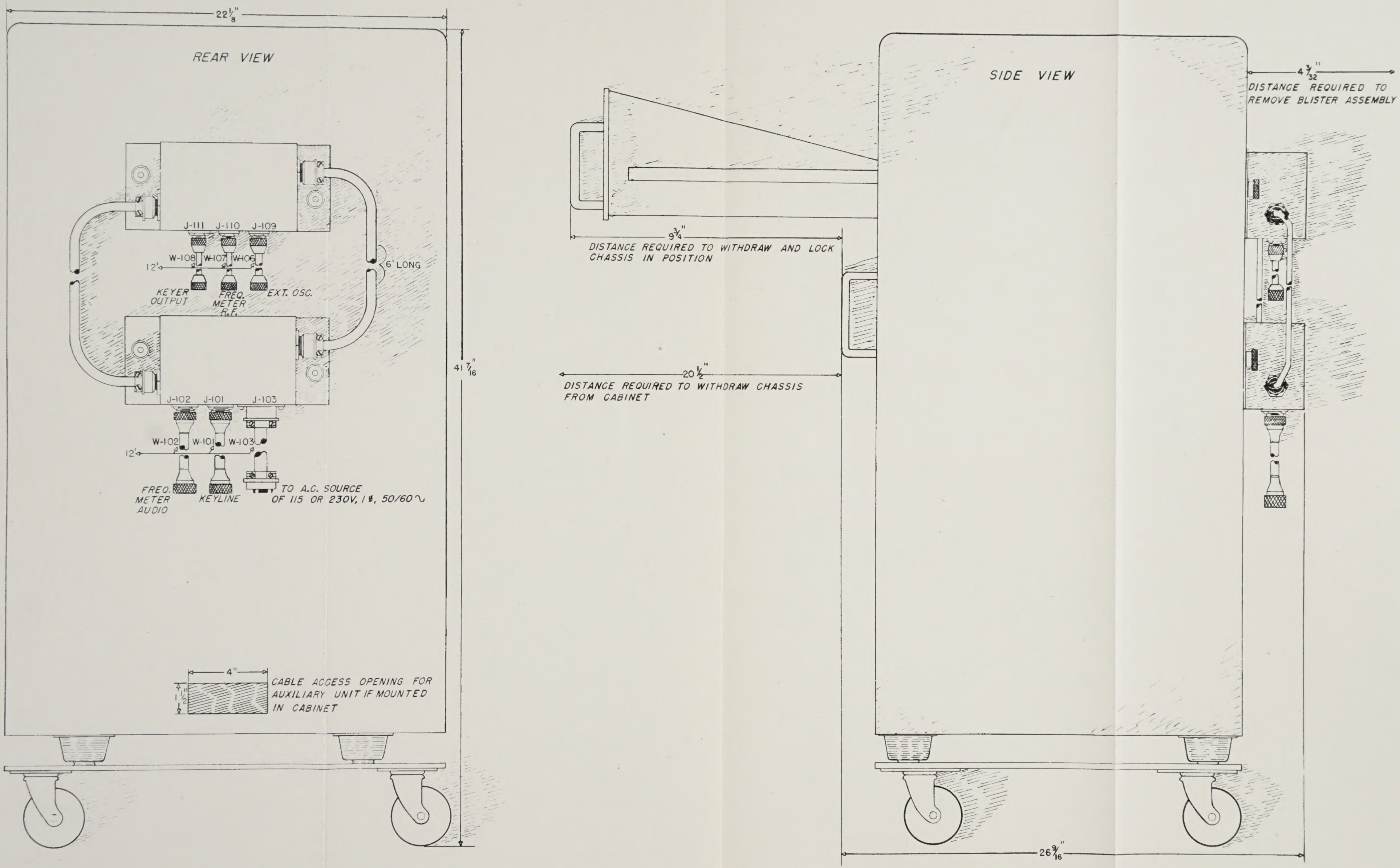

22 1/8"
REAR VIEW
J-111
J-110
J-109
W-108
W-107
W-106
12'
6' LONG
KEYER OUTPUT
FREQ. METER R.F.
EXT. OSC.
J-102
J-101
J-103
W-102
W-101
W-103
12'
FREQ. METER AUDIO
KEYLINE
TO A.C. SOURCE OF 115 OR 230V, 1 ø, 50/60 ∿
41 7/16"
4"
1 1/2"
CABLE ACCESS OPENING FOR AUXILIARY UNIT IF MOUNTED IN CABINET
SIDE VIEW
4 3/32"
DISTANCE REQUIRED TO REMOVE BLISTER ASSEMBLY
9 3/4"
DISTANCE REQUIRED TO WITHDRAW AND LOCK CHASSIS IN POSITION
20 1/2"
DISTANCE REQUIRED TO WITHDRAW CHASSIS FROM CABINET
26 9/16"

Figure 3–1. Keyer KY-58/GRT, Dimensional Outline and External Connection Drawing

SECTION 3
INSTALLATION

1. UNPACKING.

The Keyers KY-58/GRT or KY-75/SRT and equipment repair parts are carefully packed in separate wooden crates for overseas shipment. One set of cables is provided with the KY-58/GRT. No cables are supplied with the KY-75/SRT but all connectors required to make up the necessary cables are provided. Two instruction books are shipped with the equipment. The equipment is contained in moisture-proof barrier cartons having an 18 months supply of Silica Gel. Do not open the cartons until the equipment is being installed, as the Silica Gel will saturate rapidly upon exposure to humid atmosphere. The recommended procedure to employ in unpacking each piece of equipment is as follows.

Step 1. Cut the metal straps around the crate and remove the side that reads 'Open This Side'. The cover is secured by nails and an ordinary nail puller or claw hammer may be employed.

Step 2. Remove sufficient filler material from the crate to permit access to the carton. Lift out the packaged items.

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Step 7. Inspect the equipment for any damage incurred during shipment.

Step 8. The equipment spare parts set is packed in a manner similar to the keyer and its unpacking will follow the procedure outlined above in steps 1 through 7.

Step 9. The packing crates and packing material should be saved in event the equipment has to be repacked and shipped at a later date.

2. INSTALLATION.

Both units of the keyer are designed for mounting in the cabinet furnished for this purpose. Both sub-units may, however, be mounted in any standard 19-inch rack panel. When this is done it will be necessary to secure the blister assembly to the units. This is accomplished by means of the four 10-32" screws packed in the equipment repair parts box. Thread the screws through the opening in the head of the captive thumb screws at each side of the blisters until they are securely engaged into the chassis.

WARNING

> Voltages employed in the associated transmitter are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment. NEVER MEASURE POTENTIALS IN EXCESS OF 1000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

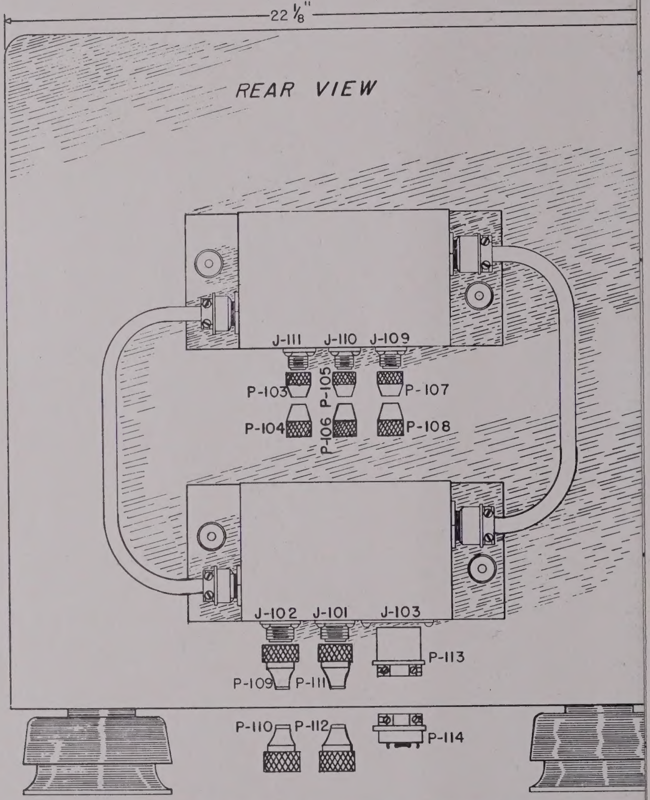
a. POSITIONING OF CABINET.

(1) KY-58/GRT.—When determining the location of the cabinet make sure that a minimum access space of approximately two feet is provided at the rear of the cabinet or the location is such that the cabinet may be rolled forward to permit access to the back. See Figure 3–1 for a dimensional drawing. This is adequate space for servicing (removal of blisters). Place the cabinet CY-1132/GRT in that part of the room where the temperature will be more or less constant i.e. not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter. Cables furnished for connections to the transmitter and other external equipment are 12 feet long.

(2) KY-75/SRT.—When mounting the KY-75/SRT cabinet CY-1133/SRT atop an operating table or bench allow sufficient space at the rear of the cabinet to permit access to the blister units. See Figure 3–2 for a dimensional outline drawing. Place the cabinet in that part of the room where the temperature will be more or less constant i.e., not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter.

b. ARRANGEMENT OF UNITS.—The blank panel in the bottom section of Keyer KY-58/GRT may be removed in the event it is desired to mount other equipment in the cabinet. Make sure that all mounting screws are turned tightly into place.

c. INSTALLATION OF CRYSTALS.—Crystals for operation of the keyer are not supplied by the contractor. Crystals for equipment operation are furnish-



FUNCTION	PLUG	TYPE	RECOMMENDED CABLE(NOT
KEYER OUTPUT	P-103 & P-104	-49195	TYPE RG-8/U
FREQ. METER R. F.	P-105 & P-106	-49195	TYPE RG-8/U
EXT. OSC.	P-107 & P-108	-49195	TYPE RG-8/U
FREQ. METER AUDIO	P-109 P-110	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
KEYLINE	P-111 P-112	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
A.C. LINE, 115 OR 230V, ϕ, 50/60 ∿	P-113 P-114	3WIRE POLARIZED (FEMALE) HUBBELL #7559-G 3WIRE POLARIZED (MALE) HUBBELL #7311-G	TYPE MCOS-2

Figure 3–2. Keyer KY-75/SRT, Dimensional Outline and Externa

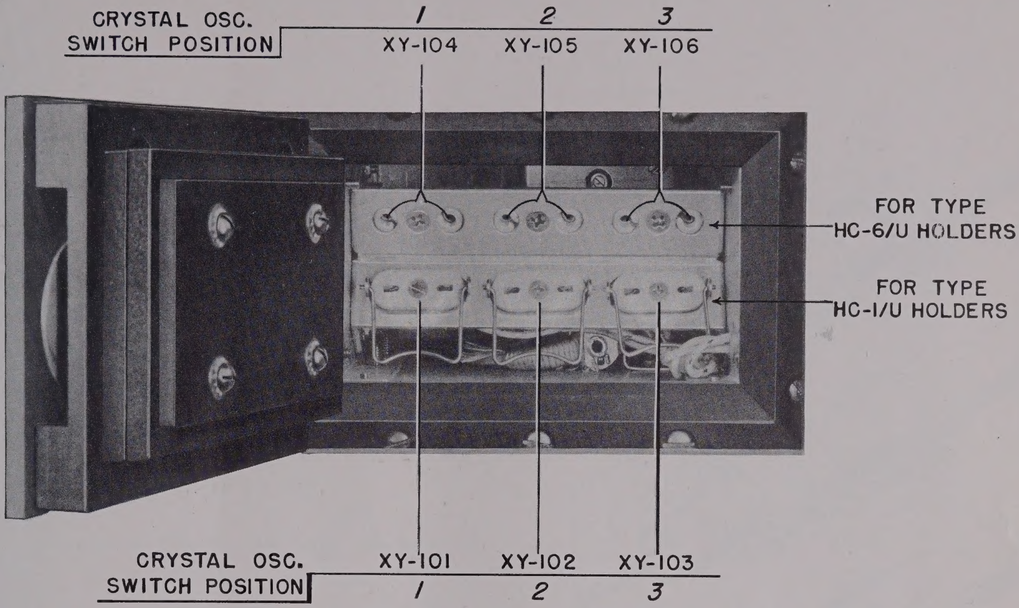


Figure 3-3. Crystal Socket Identification

ed by the Navy Department at the point of installation. Parallel wired sockets are provided to mount either crystal holders type HC-1/U (3/4 inch pin spacing) or type HC-6/U holders (1/2 inch pin spacing). Only one type of crystal may be employed at each position simultaneously. The sockets are so arranged that it is physically impossible to plug two crystals into two parallel sockets.

The frequency of the operating crystal must be 200 kilocycles lower than the carrier frequency at the output of the keyer. To determine the proper crystal to use, observe the following procedure.

Step 1. Divide the desired channel frequency in kilocycles by the multiplication factor of the transmitter.

Step 2. Subtract 200 kilocycles from the result of step 1.

Example: If the desired channel frequency were 12,000 kc. and the multiplication factor of the transmitter 3, the output of the keyer would be 12,000 kc. divided by 3 or 4,000 kc. Therefore the crystal frequency would be 200 kcs. less or 3800 kcs.

The crystal sockets are made accessible by opening the front-panel door located below the oven thermometer. Insert the crystals in their proper sockets with respect to the holders employed and the switch positions desired for selection of a particular crystal. The crystals may be inserted in any position with respect to frequency. Refer to Figure 3-3 for crystal socket identification. Record the frequency on the Tuning Chart on the front panel.

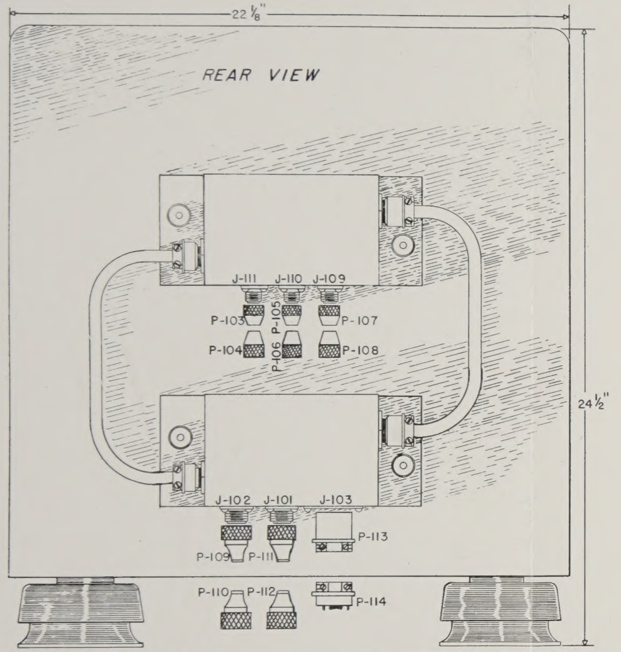
d. EXTERNAL CONNECTIONS.

(1) KY-58/GRT.—Various connections have to be made to place the keyer in operation. All necessary interconnecting cables are furnished with the KY-58/GRT. The cables are marked at both ends to identify the cable functions. All connections to and from the keyer are made on the blister assembly at the rear of the cabinet. Refer to Figure 3-1 for the location of the various connectors.

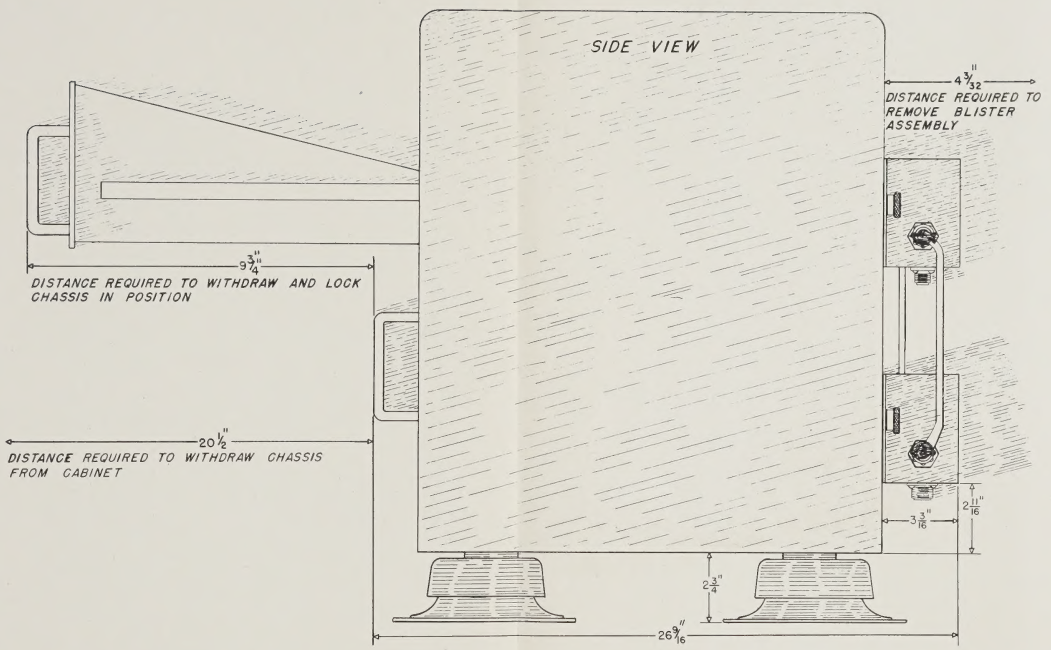
(2) KY-75/SRT.—No interconnecting cables are provided with the KY-75/SRT. Figure 3-2 is the external connection diagram. Figures 3-4, 3-5 and 3-6 specify the connectors and type of cable to be used and illustrate the method of fabricating the cables to install the keyer. All plug connectors are furnished for this purpose. The maximum length of the cables is not critical and should be determined by the particular installation.

(3) AM-655/URT TO MD-165/URT INTERCONNECTIONS.—No interconnecting wiring is necessary between the AM-655/URT and MD-165/URT as the two are permanently connected through the blister assemblies.

(4) KEYER INPUT CONNECTIONS.—Connect the A.C. input cable W-103 between the A.C. input jack



FUNCTION	PLUG	TYPE	RECOMMENDED CABLE(NOT SUPPLIED)
KEYER OUTPUT	P-103 & P-104	-49195	TYPE RG-8/U
FREQ. METER R. F.	P-105 & P-106	-49195	TYPE RG-8/U
EXT. OSC.	P-107 & P-108	-49195	TYPE RG-8/U
FREQ. METER AUDIO	P-109	AN3106B-14S-1S	TYPE MCOS-2
	P-110	AN3106B-14S-1P	
KEYLINE	P-111	AN3106B-14S-1S	TYPE MCOS-2
	P-112	AN3106B-14S-1P	
A.C. LINE, 115 OR 230V, ∅, 50/60 ∿	P-113	3WIRE POLARIZED (FEMALE) HUBBELL # 7559-G	TYPE MCOS-2
	P-114	3WIRE POLARIZED (MALE) HUBBELL # 7311-G	


SIDE VIEW
4 3/32"
DISTANCE REQUIRED TO REMOVE BLISTER ASSEMBLY
9 3/4"
DISTANCE REQUIRED TO WITHDRAW AND LOCK CHASSIS IN POSITION
20 1/2"
DISTANCE REQUIRED TO WITHDRAW CHASSIS FROM CABINET
3 3/16"
2 11/16"
2 3/4"
26 9/16"

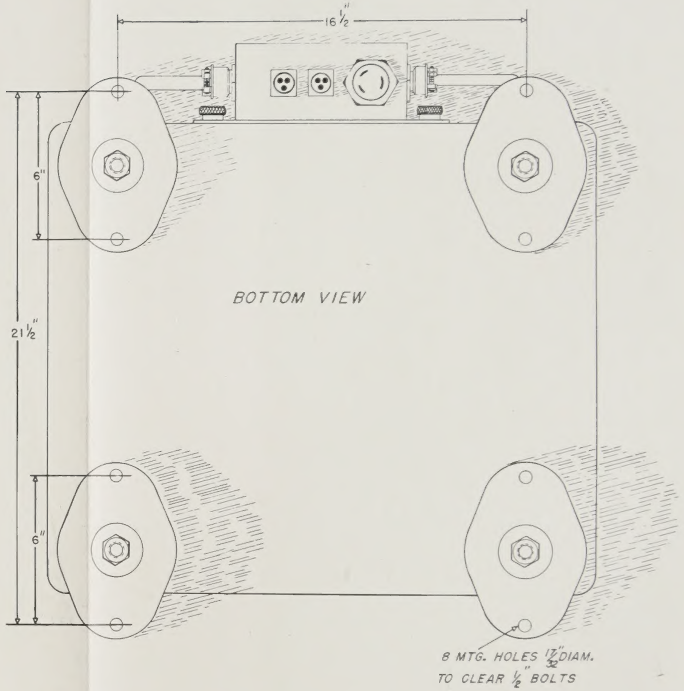


Figure 3-2. Keyer KY-75/SRT, Dimensional Outline and External Connection Drawing

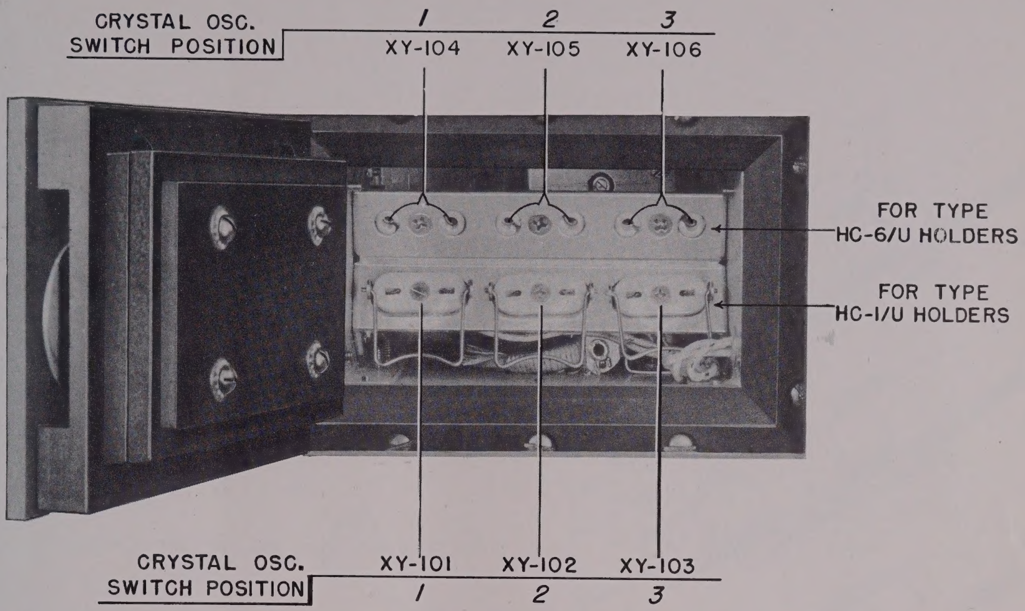


Figure 3–3. Crystal Socket Identification

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Step 1. Divide the desired channel frequency in kilocycles by the multiplication factor of the transmitter.

Step 2. Subtract 200 kilocycles from the result of step 1.

Example: If the desired channel frequency were 12,000 kc. and the multiplication factor of the transmitter 3, the output of the keyer would be 12,000 kc. divided by 3 or 4,000 kc. Therefore the crystal frequency would be 200 kcs. less or 3800 kcs.

The crystal sockets are made accessible by opening the front-panel door located below the oven thermometer. Insert the crystals in their proper sockets with respect to the holders employed and the switch positions desired for selection of a particular crystal. The crystals may be inserted in any position with respect to frequency. Refer to Figure 3–3 for crystal socket identification. Record the frequency on the Tuning Chart on the front panel.

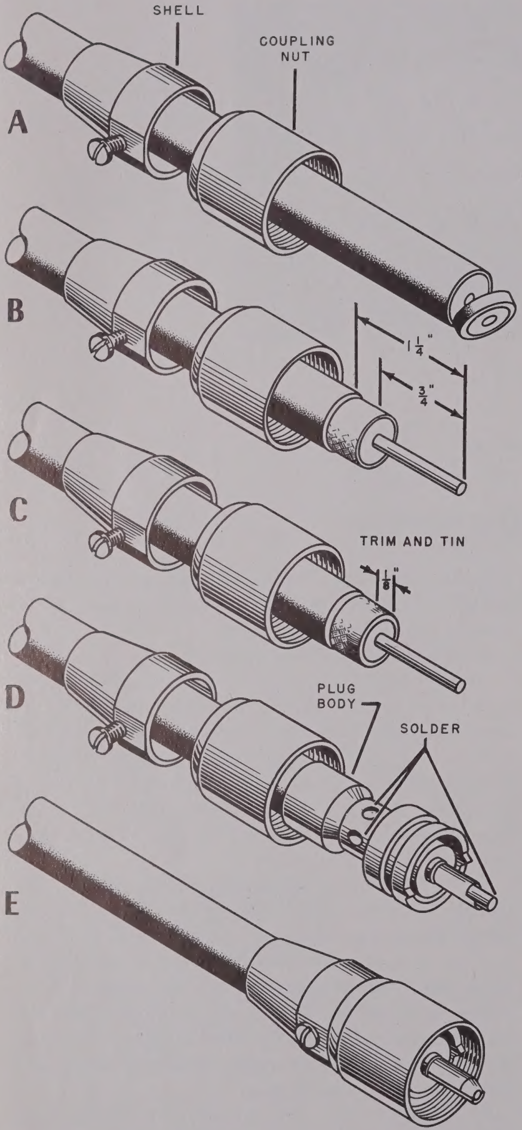
d. EXTERNAL CONNECTIONS.

(1) KY-58/GRT.–Various connections have to be made to place the keyer in operation. All necessary interconnecting cables are furnished with the KY-58/GRT. The cables are marked at both ends to identify the cable functions. All connections to and from the keyer are made on the blister assembly at the rear of the cabinet. Refer to Figure 3–1 for the location of the various connectors.

(2) KY-75/SRT.–No interconnecting cables are provided with the KY-75/SRT. Figure 3–2 is the external connection diagram. Figures 3–4, 3–5 and 3–6 specify the connectors and type of cable to be used and illustrate the method of fabricating the cables to install the keyer. All plug connectors are furnished for this purpose. The maximum length of the cables is not critical and should be determined by the particular installation.

(3) AM-655/URT TO MD-165/URT INTERCONNECTIONS.–No interconnecting wiring is necessary between the AM-655/URT and MD-165/URT as the two are permanently connected through the blister assemblies.

(4) KEYER INPUT CONNECTIONS.–Connect the A.C. input cable W-103 between the A.C. input jack



A SQUARE OFF END OF CABLE. SLIDE SHELL AND COUPLING NUT OVER CABLE.

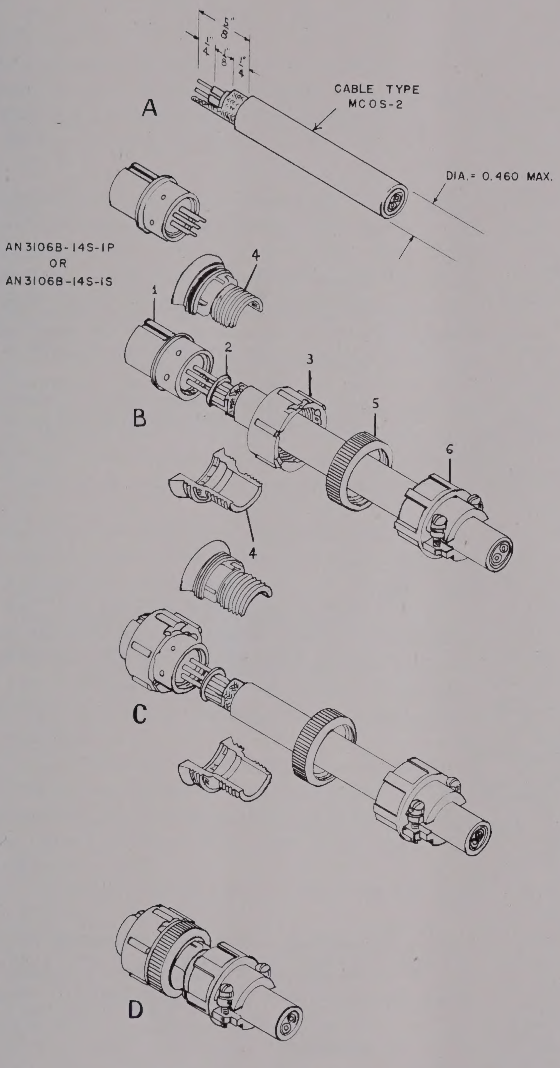
B REMOVE $1\frac{1}{4}$ INCHES OF THE OUTER JACKET. BE CAREFUL NOT TO NICK THE COPPER BRAID BENEATH. CUT THE COPPER BRAID AND INNER INSULATION $\frac{3}{4}$ INCH FROM THE END.

C COMB OUT, TRIM, AND TIN COPPER BRAID.

D SCREW THE PLUG BODY OVER THE OUTER JACKET UNTIL $\frac{1}{16}$ INCH OF THE INNER CONDUCTOR PROJECTS FROM THE CONTACT SLEEVE. BE CAREFUL NOT TO PUSH BACK THE COPPER BRAID. SOLDER THE PLUG BODY TO THE COPPER BRAID THROUGH THE HOLES PROVIDED. SOLDER THE INNER CONDUCTOR TO THE CONTACT SLEEVE. REMOVE ANY EXCESS SOLDER AND CUT OFF THE INNER CONDUCTOR WHERE IT PROJECTS FROM THE CONTACT SLEEVE.

E SLIDE THE COUPLING NUT FORWARD UNTIL IT IS SEATED AGAINST THE SHOULDER OF THE PLUG BODY. SLIDE THE SHELL FORWARD TO CLAMP THE PLUG BODY TIGHTLY TO THE CABLE; FASTEN IN PLACE WITH SET SCREW.

Figure 3–4. Assembly of -49195 Connector and RG-8/U Cable for Keyer Output, Freq. Meter R.F. and Ext. Osc. Connections

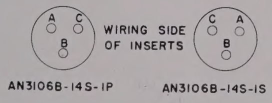


A REMOVE APPROXIMATELY 5/8 INCH OF THE OUTER PROTECTIVE JACKET FROM THE END OF THE CABLE. IF THE CABLE IS ARMORED, ARMOR SHOULD TERMINATE AT THE SAME POINT AS THE CABLE JACKET. FASTEN CUT END OF ARMOR WITH FRICTION TAPE OR BY OTHER SUITABLE MEANS.
FAN OUT SHIELDING AND TWIST TO A POINT APPPOXIMATELY 1/4 INCH FROM THE END OF THE PROTECTIVE JACKET.
BARE THE EXPOSED CONDUCTORS FOR 1/4 INCH. TIN THE ENDS OF THE CONDUCTORS AND SHIELD.

B INSERT THE CABLE PREPARED AS IN STEP A THROUGH CLAMP (6), RETAINING RING (5), AND SWIVEL NUT (3) BEFORE SOLDERING CONNECTIONS. SOLDER CONNECTIONS TO CONNECTIONS IN INSERT OF PLUG BODY (1), OBSERVING COLOR CODE BELOW. SLIP BONDING RING (2) OVER CABLE SHIELD, AND SOLDER TO TAB END OF SHIELD.

C ASSEMBLE BY SLIDING SWIVEL NUT (3) OVER PLUG BODY (1) AND ENGAGE THE HALVES OF THE SPLIT SHELL (4) WITH THE PROJECTIONS ON THE PLUG BODY. BE SURE THAT THE BONDING RING FITS IN THE SPACE PROVIDED FOR IT IN THE SPLIT SHELL.

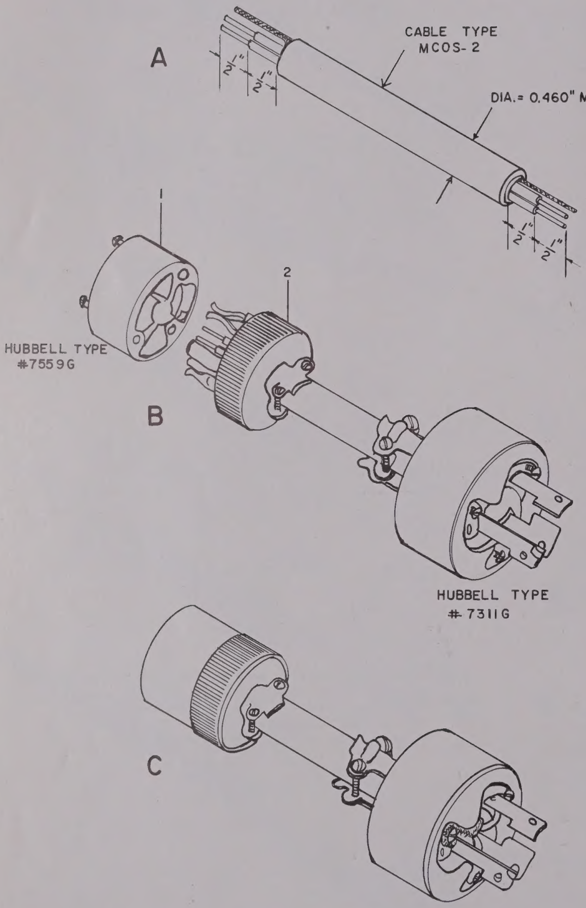
D FINISH THE ASSEMBLY BY SCREWING THE RETAINING RING (5) ONTO THE ASSEMBLED SPLIT SHELL. SCREW THE CLAMP (6) ONTO THE SPLIT SHELL. TIGHTEN THE CLAMPING SCREW ON THE SIDES OF THE CLAMP TO HOLD CABLE SECURELY.



COLOR CODE CONNECTION DIAGRAM

PIN	COLOR
A	BLACK
B	SHIELD
C	WHITE

Figure 3–5. Assembly of AN 3106B-14S-1S and AN 3106B-14S-1P Connectors to Type MCOS-2 Cable for Freq. Meter Audio and Keyline Connections



A REMOVE APPROXIMATELY 1 INCH OF THE OUTER PROTECTIVE JACKET FROM THE END OF THE CABLE. IF THE CABLE IS ARMORED, ARMOR SHOULD TERMINATE AT THE SAME POINT AS THE CABLE JACKET. FASTEN CUT END OF ARMOR WITH FRICTION TAPE OR BY OTHER SUITABLE MEANS.
FAN OUT SHIELDING AND TWIST TO A POINT.
BARE THE EXPOSED CONDUCTORS FOR $\frac{1}{2}$ INCH.
TIN THE ENDS OF THE CONDUCTORS AND SHIELD.

B INSERT THE CABLE PREPARED AS IN STEP A THROUGH THE PLUG BODIES. SECURE SHIELD TO GROUND TERMINAL IN EACH PLUG AND SECURE BLACK AND WHITE LEADS TO CORRESPONDING TERMINALS IN EACH PLUG.

C ASSEMBLE PLUG #7559G BY MATING PART (1) TO PART (2) AND SECURING SCREWS. PLUG CAN ONLY BE REASSEMBLED BY OBSERVING PROPER POLARITY BETWEEN PARTS (1) AND (2). TIGHTEN THE CLAMPING SCREW ON THE SIDES OF THE CLAMP ON EACH PLUG TO HOLD CABLE SECURELY.

Figure 3–6. Assembly of A.C. Connectors to Type MCOS-2 Cable

J-103 located at the rear of the cabinet and a suitable 115 V.A.C. supply source.

(5) KEYER OUTPUT CONNECTIONS.

NOTE

The output of the keyer can be applied to any existing C.W. transmitter capable of operating from a 2 to 20-volt excitation source at a frequency of 1000 to 6700 kc.

Disconnect the frequency determining source of the associated transmitter and connect the output of the keyer in its place. Connect the output cable W-108 between the keyer output jack J-111 and the transmitter oscillator input circuit. Since the output impedance of the keyer is 75 ohms, the output cable must be terminated at the transmitter in a 75-ohm load.

(6) TELETYPE CONNECTIONS.—Connect one end of the teletype input cable W-101 to the keyer input jack J-101 located at the rear of the cabinet. Connect the other end of the cable to the teletype output circuit.

(7) PHOTO SCANNER CONNECTIONS.—Keyer connections to the photo scanner are made employing cable W-101 connected between the keyer input jack J-101 and the photo scanner output circuit.

(8) EXTERNAL OSCILLATOR CONNECTIONS.—Connect the external oscillator cable W-106 between the EXT. OSC. input jack J-109 located at the rear of the cabinet and the output connector of the external oscillator.

e. T-101 PRIMARY CONNECTIONS.—The keyer is wired at the factory for 115-volt operation. For 230-volt operation minor wiring changes will be necessary at the primary of power transformer T-101 and at the crystal oven.

(1) 230-VOLT PRIMARY CONNECTIONS OF T-101.

Step 1. Remove the jumper between terminals 1 and 3. Remove the jumper between terminals 2 and 4.

Step 2. Connect a jumper between terminals 2 and 3.

(2) 230- VOLT OVEN CONNECTIONS.

Step 1. Remove the jumper between terminals 6 and 9 on TB-102.

Step 2. Move the lead connected to terminal 8 of TB-102 over to terminal 9 of TB-102.

(3) 230-VOLT OVEN LAMP CONNECTION.—Remove one jumper connecting R-199 and R-200 in parallel.

3. INITIAL ADJUSTMENTS AND PERFORMANCE TEST.

After installation has been completed as outlined in paragraph 2 of this section a short test transmission should be made in order to ascertain that the keyer and associated equipment are functioning properly before being turned over to operating personnel. Refer to Figure 3-7 for identification and location of all front-panel components.

The keyer is accurately aligned before leaving the factory. The semi-operating controls are permanently set and need not be readjusted during installation or operation. If the semi-operating controls are inadvertently moved refer to section 7, Corrective Maintenance, for alignment data.

To make a short test transmission proceed as outlined in the following paragraphs. In making the following adjustments, the final setting of the controls for a particualr transmitting frequency should be recorded on the Tuning Chart to assist in re-establishing the conditions promptly at a later date. If any difficulty is experienced in making any adjustments specified in the following procedure refer to section 7, Corrective Maintenance.

a. FREQUENCY-SHIFT OPERATION.

Step 1. Set the POWER switch at ON. White-jewel Power lamp will light. Amber-jewel oven lamp will also light. The illumination given off by these lamps may be adjusted by rotation of the serrated rim of the lamp assembly. Illumination of the amber-jewel pilot lamp indicates that the crystal oven heater is on. This lamp will go on and off at intervals with changes in the crystal oven temperature in the following manner.

(a) Lamp illuminated: heat is being applied and the lamp will remain lighted until the operating temperature of the oven has reached approximately 70°C as indicated on the oven thermometer.

(b) Lamp off: no heat is being applied and the lamp will remain off until the temperature drops slightly below 70°C.

Step 2. After the lamp has turned off which indicates that the oven has reached its operating temperature set the PLATE switch at ON. Red-jewel PLATE lamp will light. The illumination given off by this lamp is also adjustable.

Step 3. Set the TEST-OPERATE switch at FSK.

Step 4. Set the CRYSTAL-OSC. switch at the position corresponding to the socket position of the crystal providing the desired channel frequency.

Step 5. Set the FREQ. RANGE switch at the position encompassing the output frequency of the keyer.

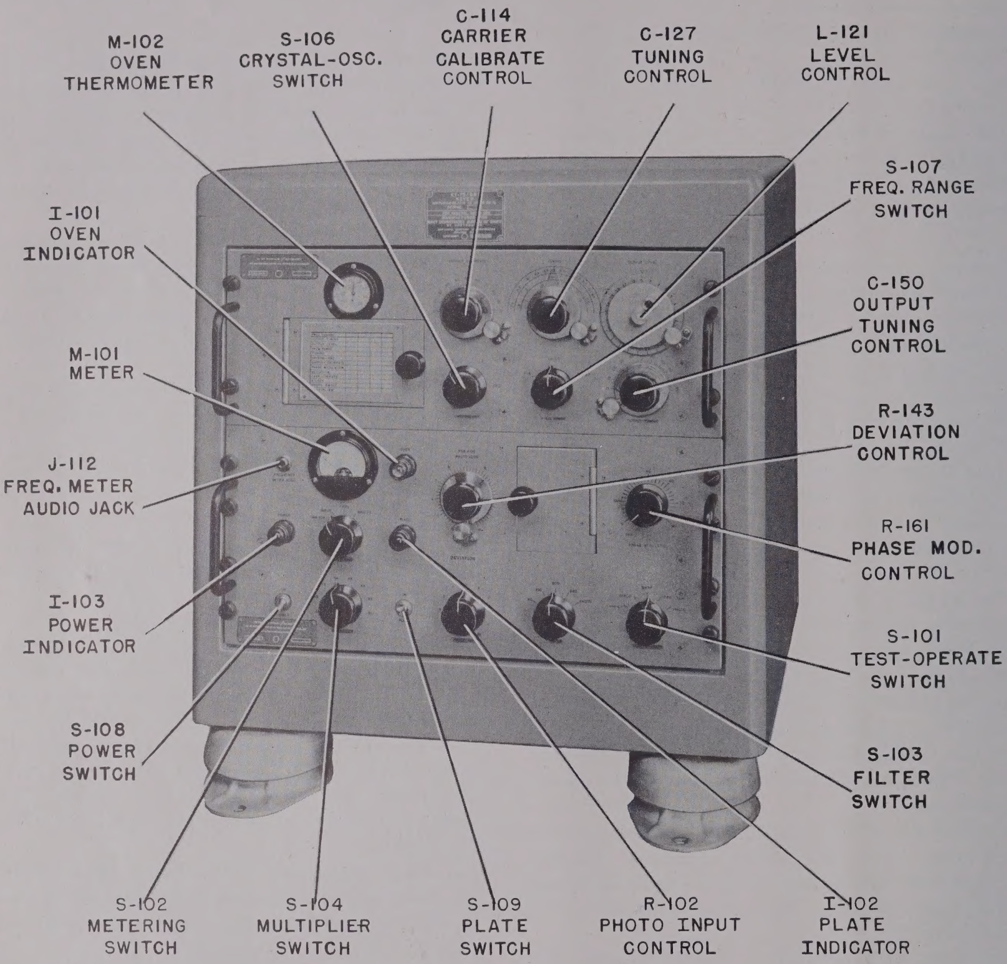


Figure 3–7. Front-Panel Component Identification

The RF output of the keyer is equal to, or is some definite fraction of, the final transmitting frequency depending upon the frequency multiplication of the radio transmitter. Hereafter the term 'keyer output frequency' will be understood to mean the crystal frequency plus the 200 kilocycles from the low frequency oscillator.

Step 6. Set the INPUT FILTER switch at the position corresponding to the highest dot-cycle rate to be transmitted. Four positions are provided: 60, 100, 200 and 240.

Step 7. Set the MULTIPLIER switch at the position corresponding to the multiplication factor employed in the transmitter. For example, if the multiplication factor is 8, the switch should be set at 'X8'.

Step 8. Set the PHASE MODULATION control at OFF (extreme counterclockwise position).

Step 9. Set the METERING switch at Grid. Loosen the lock on the TUNING control and set the control at the frequency corresponding to the keyer output frequency and carefully adjust it about this setting for a maximum meter reading. A normal reading is 1.3 ma. Lock the control in this position. It will be noticed that three current peaks corresponding to the resonant peaks for the lower sideband, the R.F. carrier and the upper sideband, in the order named, are observed on the panel meter. The TUNING control is normally set at the position which corresponds to the upper sideband resonant peak.

Step 10. Set the METERING switch at Plate. Release the lock on the OUTPUT TUNING control. Adjust the OUTPUT TUNING control for minimum plate current as indicated on the panel meter.

Step 11. Release the lock on the OUTPUT LEVEL control. Set the OUTPUT LEVEL control for the maximum grid drive required to drive the first amplifier or multiplier stage of the transmitter as indicated by a maximum reading on the grid meter of the associated transmitter.

NOTE

> Care should be taken in this adjustment since, if the tuning range is located near the lower markings on the TUNING dial, it is possible that a dip may also be obtained near the higher markings of the dial due to the second harmonic of the keyer frequency.

Step 12. Repeat steps 10 and 11 adjusting the OUTPUT TUNING control and the OUTPUT LEVEL control simultaneously. As the output coupling is increased and the plate tuning maintained at resonance the output power should increase as indicated by a rising plate current reading and an increase in grid drive as noted on the grid meter of the associated transmitter. Rated power output is obtained when a reading of 85 ma. (actual meter reading of 0.425 ma.) is indicated on the panel meter. Lock the OUTPUT TUNING and OUTPUT LEVEL controls in position.

Step 13. Set the DEVIATION control at the desired deviation.

Step 14. To shut the keyer off set the PLATE switch at OFF and the POWER switch at OFF. If further tests are to be made the POWER switch should be left at ON to maintain the correct operating temperature of the oven.

b. PHASE MODULATION.—During periods of adverse operating conditions it may be advisable to employ phase modulation. To use phase modulation turn the PHASE MODULATION switch to ON by rotating the PHASE MODULATION control clockwise. One radian of phase modulation is obtained by rotating the control to the elongated marker on the phase modulation calibration dial. The PHASE MODULATION control is calibrated from 0° to 60°.

c. PHOTO OPERATION.—The initial adjustment of the keyer controls for photo transmission are the same as those given for frequency-shift operation in paragraph a. of this section plus the following steps:

(1) Set the TEST-OPERATE switch at PHOTO.

(2) Set the INPUT FILTER switch at PHOTO.

(3) Set the METERING switch at PHOTO.

(4) Adjust the PHOTO INPUT control for 5 volts as indicated on the panel meter. The five volts can be obtained by locking the photo scanner in the MARK position. If the photo scanner is not available any battery source providing five volts or more can be used.

d. FREQUENCY ACCURACY.—Each of the three R.F. outputs of the keyer should be checked to insure that its frequency is accurate and stable.

Step 1. Connect cable W-107 between the keyer FREQ. meter R.F. jack J-110 and the input of a frequency meter.

Step 2. Note the frequencies of the three crystals in the crystal oven.

Step 3. With the keyer operating under normal operating conditions set the CRYSTAL-OSC. switch at position one. Set the FREQ. RANGE switch at the position encompassing the keyer output frequency.

Step 4. Set the TUNING dial at the position corresponding to the keyer output frequency (200 kcs. above the crystal frequency).

Step 5. Set the MULTIPLIER switch at the position corresponding to the multiplication factor of the transmitter.

Step 6. Set the TEST-OPERATE switch at CARRIER.

Step 7. Adjust the frequency meter to the keyer output frequency. Note the reading on the frequency meter. The frequency as noted on the frequency meter should be equal to the crystal frequency plus the 200 kilocycles obtained from the 200-kc. oscillator.

If a slight inaccuracy is observed adjust the CARRIER CALIBRATE control to make the required correction. Make sure the control is locked securely after adjustment. This control has a range of 40 cycles.

Step 8. Repeat steps 3 through 7 inclusive on the other two FREQ. RANGE switch settings to check the other two frequencies. A compromise setting of the CARRIER CALIBRATE control might be needed if two or more settings of the FREQ. RANGE switch require readjustment of the CARRIER CALIBRATE control.

An overall frequency check of the keyer and transmitter can be performed in the following manner if an accurately calibrated receiver covering the frequency range of the transmitter is available.

Step 1. If the transmitter has an OPERATE-TUNE switch or other means of reducing power, set the transmitter at reduced power.

Step 2. Place the receiver a suitable distance away from the transmitter. Adjust the R.F. GAIN and AUDIO GAIN controls of the receiver to prevent the receiver from overloading. Set the C.W.O. control at ON.

Step 3. Tune the receiver to the transmitter's frequency. The frequency as read on the receiver's dial should be the crystal frequency of the keyer plus 200 kcs. multiplied by the multiplication factor of the transmitter. Required correction is made by the CARRIER CALIBRATE control.

An extremely accurate frequency check may be made if the installation facilities are such that a frequency standard is available with an accuracy capable of detecting frequency inaccuracies within the frequency tolerance of the crystal. Here again the CARRIER CALIBRATE control is used to make any frequency correction. If frequency accuracy of a high order is demanded the foregoing check should be made each time a crystal change is made.

e. DEVIATION.

Step 1. Set the transmitter at reduced power.

Step 2. Determine the multiplication factor of the transmitter. Set the MULTIPLIER switch at a position corresponding to the multiplication factor of the transmitter.

Step 3. Connect a high frequency receiver as close as possible to the transmitter. Adjust the receiver for C.W. operation.

Step 4. Tune the receiver to the transmitted frequency. Reduce the R.F. GAIN and AUDIO GAIN controls to prevent the receiver from overloading.

Step 5. Set the keyer TEST-OPERATE switch at MARK. Vary the DEVIATION control from minimum to maximum. The audio pitch of the received signal should vary as the DEVIATION control is turned toward maximum.

Step 6. Set the keyer TEST-OPERATE switch at CARRIER. Vary the DEVIATION control from minimum to maximum. The audio pitch of the received signal should not vary as the DEVIATION control is varied from minimum to maximum.

Step 7. Set the keyer TEST-OPERATE switch at SPACE. Vary the DEVIATION control from minimum to maximum. The audio pitch of the received signal should vary in the opposite direction from Mark as in step 5 as the DEVIATION control is turned toward maximum.

f. KEYING SIGNAL INPUT.—Using a monitoring receiver, or equivalent means, check that the input telegraph keying signals are not reversed. Make the check in accordance with the following procedures:

(1) Set the TEST-OPERATE switch at FSK. Set the Teletypewriter at Mark. Observe that the transmitting frequency is shifting upward.

(2) Set the Teletypewriter at SPACE. Observe that the transmitting frequency is shifting downward.

(3) If necessary, check that the keyer input signal nominal voltages and polarities are as follows:

Mark +40 to +120 volts
Space 0 to -100 volts

The procedure outlined in paragraph 3 completes all initial adjustments and tests. After these tests have been completed the keyer may be turned over to operating personnel.

SECTION 4
OPERATION

1. INTRODUCTION.

The keyer is an electronic device designed to replace the frequency determining oscillator of a conventional C.W. transmitter. The addition of the keyer modifies the transmitter to permit frequency-shift keying or facsimile (photo) transmissions. The keyer transmits telegraphic characters or varies the intensity of the photo signals by shifting the frequency of the transmitter's carrier back and forth while the carrier remains on continuously. During frequency-shift keying operation, the frequency of the transmitter's carrier appears at a certain frequency during KEY-OPEN or SPACE intervals and shifts a few hundred cycles higher during KEY-CLOSED or MARK condition.

The keyer provides a circuit for phase modulating the transmitter's output at 200 cycles-per-second. Phase modulation spreads the energy of the signal over a wider frequency band thereby providing a simple means for achieving a certain amount of frequency diversity. By employing phase modulation during periods of selective fading complete loss of the signal becomes less probable.

Operation of the keyer is completely automatic after it has been aligned to the operating frequency. After alignment is completed no further adjustments are necessary unless the operating frequency or deviating frequency is changed.

The scope of this section is to provide the operator with sufficient information for efficient operation of the keyer.

2. GENERAL.

Before attempting to use the keyer with its associated transmitter, be sure that operational procedures for the transmitter are thoroughly understood. Refer to the operation section of the instruction manual pertaining to the associated transmitter.

The procedure for setting up the keyer and transmitter for frequency-shift keying and facsimile transmission is that of adjusting the crystal oscillator and tuned circuits of the keyer to the desired crystal frequency. A signal from the teletype or scanner is then applied to the keyer where it is frequency modulated and then coupled to the associated transmitter where it is multiplied to the channel frequency.

The frequency deviation of the keyer for frequency-shift operation is adjustable over a range of zero to 1000 cycles-per-second in order that the actual transmitted frequency may be adjusted to any value from 0 to 500 cycles-per-second higher for the MARK signal and the same number of cycles lower for the SPACE signals. The frequency deviation capabilities for photo transmission provide a frequency variation of any value between 0 and 2000 cycles-per-second i.e. 0 to ±1000 cycles-per-second with respect to the carrier frequency.

3. CONTROLS.

Normal operation of the keyer is accomplished entirely by means of front-panel mounted controls. This subsection is presented to familiarize the operator with the function of each operational control and device. All front panel components of the keyer are located and identified on Figure 3–7.

a. POWER SWITCH.–This is a toggle switch which turns the keyer A.C. input power ON and OFF.

b. PLATE SWITCH.–This is a toggle switch which turns the keyer plate voltage ON and OFF.

c. PHOTO INPUT CONTROL.–The photo signal is applied directly to the PHOTO INPUT control. This control is adjusted so that a five-volt signal is applied directly to the frequency shifting circuits. A front-panel meter gives a visual indication of the magnitude of the photo input signal.

d. TEST-OPERATE SWITCH.–The TEST-OPERATE switch is a five-position switch utilized to select the circuit arrangement required for frequency shift operation and/or photo operation and the arrangement required to perform the alignment adjustments for carrier, mark and space conditions.

(1) CARRIER.–In the CARRIER position the carrier condition is simulated locally in the keyer for alignment and calibration purposes.

(2) SPACE.–In the SPACE position the space condition is simulated in the keyer for alignment and calibration purposes.

(3) MARK.–In the MARK position the MARK con-

dition is simulated in the keyer for alignment and calibration purposes.

(4) FREQUENCY-SHIFT.—With the switch in the FSK position the equipment is placed in the 'ready for operation' condition for frequency-shift keying.

(5) PHOTO.—With the switch in the PHOTO position the equipment is placed in the 'ready for operation' condition for photo transmission.

e. MULTIPLIER CONTROL.—The MULTIPLIER control provides a means of dividing by 1, 2, 3, 4, 5, 6, 8, 9 or 12 times the frequency deviation thereby keeping the deviation frequency at its preset frequency regardless of the multiplication employed in the multiplier stages of the transmitter.

f. CRYSTAL-OSC. SWITCH.—This switch provides a means of selecting one of the three frequency-determining crystals. The Ext. position is provided when it is desired to use an external oscillator as the excitation source.

g. FREQ. RANGE SWITCH.—This switch provides a means of selecting the tuned circuits corresponding to the output frequency of the keyer.

h. INPUT FILTER SWITCH.—This is a five-position switch which provides a means of selecting one of the four low-pass filters in the keyer corresponding to the dot-cycle rate to be transmitted. The fifth position is used for photo operation where the low-pass filters are not used.

i. METERING SWITCH.—A three-position switch and panel meter are utilized to select the meter circuit and to obtain a visual indication of photo-input voltage, final grid current and plate current, respectively.

j. TUNING.—This control is utilized to rotate a gang-tuned capacitor through the frequency range of the transmitter. The capacitor is tuned for maximum grid drive as indicated on the panel meter. The control is calibrated in megacycles.

k. OUTPUT LEVEL CONTROL.—This control functions to vary an inductance to properly load the keyer output.

l. OUTPUT TUNING CONTROL.—This control is utilized to tune the final amplifier plate circuit to resonance as indicated on the panel meter.

m. PHASE MODULATION CONTROL.—This control is a potentiometer utilized to vary the amount of phase shift from 0° to 60°. A phase modualtion ON-OFF switch is located at the extreme counterclockwise end of the control.

n. DEVIATION CONTROL.—This control functions to vary the amount of frequency deviation. The control dial has a multiplication factor of 100 for 'FSK' operation and 200 for 'photo' operation.

o. CARRIER CALIBRATE CONTROL.—The operator should never release the lock on this control and attempt its adjustment. Its purpose is to correct slight frequency inaccuracies as determined by test.

4. OPERATING INSTRUCTIONS.

Detailed operating instructions are given herein in a step-by-step arrangement. Careful adherence to the indicated order and procedure will enable the operator to adjust the keyer to obtain maximum efficiency. The following operating procedures assume that the keyer has been properly installed, the initial adjustments have been made and the associated transmitter has been turned on. Figure 4-1 illustrates the following instructions. A Tuning Chart (see Figure 4—2) is provided on the front panel to record control settings after initial tuning. Thereafter the controls can be quickly set by reference to the Tuning Chart.

a. FREQUENCY-SHIFT KEYING OPERATION.

Step 1. Set the POWER switch at ON. White-jewel POWER lamp will light. Amber-jewel OVEN lamp will also light. Illumination of the amber-jewel lamp indicates that the crystal oven heater is on. This lamp will go on and off with changes in the crystal oven temperature in the following manner.

(1) Lamp illuminated: heat is being applied and the lamp will remain lighted until the operating temperature of the oven has reached approximately 70°C as indicated on the oven thermometer.

(2) Lamp off: no heat is being applied and the lamp will remain off until the temperature drops slightly below 70°C.

Step 2. After the lamp has turned off which indicates that the oven has reached its operating temperature set the PLATE switch at ON. Red-jewel plate lamp will light. The illumination given off by the foregoing three lamps may be adjusted by rotation of the serrated rim of the lamp assembly.

NOTE

When the keyer is not in use, keep the A.C. power connected and the POWER switch turned ON to maintain the correct operating temperature of the oven. The PLATE switch should be set at OFF.

Step 3. Set the TEST-OPERATE switch at FSK.

Step 4. Set the CRYSTAL-OSC. switch at the position corresponding to the socket position of the crystal providing the desired channel frequency.

Step 5. Set the FREQ. RANGE switch at the position encompassing the output frequency of the keyer. The 'keyer output frequency' is defined as the crystal

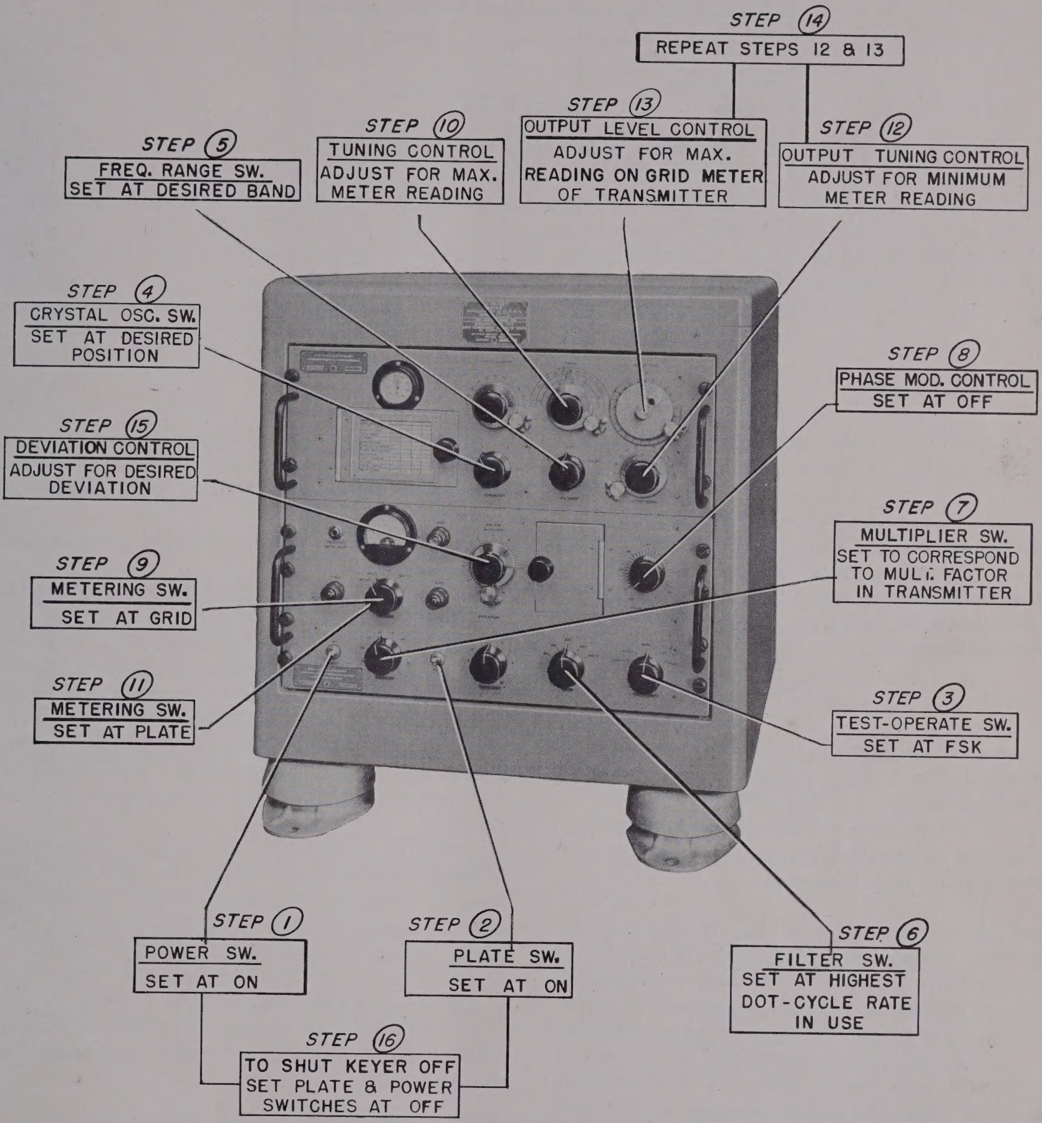


Figure 4–1. Operating Instructions for Frequency Shift Keying

frequency plus the 200 kilocycles from the low-frequency oscillator.

Step 6. Set the INPUT FILTER switch at the highest dot-cycle rate to be transmitted.

Step 7. Set the MULTIPLIER switch at the position corresponding to the multiplication factor employed in the transmitter. For example, if the multiplication factor is 8, the switch should be set at 'X8'.

Step 8. Set the PHASE MODULATION control at Off (extreme counterclockwise position).

Step 9. Set the METERING switch at GRID.

Step 10. Unlock the TUNING control. Set the TUNING control at a setting corresponding to keyer output frequency and carefully adjust it about this setting for a maximum meter reading. A normal reading is approximately 1.5 ma. (actual meter reading of 0.5). Lock the TUNING control.

Step 11. Set the METERING switch at PLATE.

Step 12. Release the lock on the OUTPUT TUN-

FREQ-CHANNEL				
OUTPUT TUNING				
OUTPUT LEVEL				
FREQ. RANGE				
TUNING				
CRYSTAL-OSC.				
CARRIER CALIBRATE				
PHASE MODULATION				
DEVIATION				
TEST-OPERATE				
FILTER				
PHOTO INPUT				
MULTIPLIER				

Figure 4–2. Tuning Chart

ING control. Adjust the OUTPUT TUNING control for minimum plate current as indicated on the panel meter.

Step 13. Release the lock on the OUTPUT LEVEL control. Set the OUTPUT LEVEL control for the maximum grid drive required to drive the first amplifier or multiplier stage of the transmitter as indicated by a maximum reading on the grid meter of the associated transmitter.

NOTE

> Care should be taken in this adjustment since, if the tuning range is located near the lower markings on the TUNING dial, it is possible that a dip may also be obtained near the higher markings of the dial due to the second harmonic of the keyer frequency.

Step 14. Repeat steps 12 and 13 adjusting the OUTPUT TUNING control and the OUTPUT LEVEL control simultaneously. As the output coupling is increased and the plate tuning maintained at resonance the output power should increase as indicated by a rising plate current reading and an increase in grid drive as noted on the grid meter of the associated transmitter. Rated power output is obtained when a reading of 85 ma. (actual meter reading of 0.425 ma.) is indicated on the panel meter. Lock the OUTPUT TUNING and OUTPUT LEVEL controls in position.

Step 15. Set the DEVIATION control at the desired deviation.

Step 16. To shut the keyer off set the PLATE switch at OFF and the POWER switch at OFF.

b. PHASE MODULATION.–During periods of adverse operating conditions it may be advisable to employ phase modulation. To use phase modulation turn the PHASE MODULATION switch ON by rotating the control clockwise. In operation the control is normally set at one radian. This setting is indicated by an elongated scale marking at 57.3° on the dial.

c. PHOTO OPERATION.–The initial adjustments of the keyer controls for photo transmission are the same as those given for frequency shift operation in para 3 a. of this section plus the following steps.

(1) Set the TEST-OPERATE switch at PHOTO.

(2) Set the INPUT FILTER switch at PHOTO.

(3) Set the METERING switch at PHOTO.

(4) With the photo scanner set at Mark, adjust the PHOTO INPUT control for 5 volts as indicated on the panel meter.

SECTION 5
OPERATOR'S MAINTENANCE

1. ROUTINE CHECKS.

The following routine checks of normal operation of the keyer are to be made by the operating personnel at the beginning of each watch. The tests are to be made with the keyer operating under normal conditions. Careful routine check of the equipment very often prevents failure under conditions when maintenance personnel are not available. The following chart assumes that the POWER switch and PLATE switch are at the ON position.

TABLE 5–1. ROUTINE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
White-jewel power lamp.	Observe lamp.	No light or intermittent light indicates poor lamp, loose connections, faulty heater voltage supply, blown fuse F-102, or defective A.C. cable W-103.
Amber-jewel oven lamp.	Observe lamp.	No light indicates poor lamp, loose connections, faulty oven components, blown fuse F-101.
Oven temperature.	Observe oven thermometer.	Lamp should remain lighted until temperature reaches 70°C.
Red-jewel plate lamp.	Observe lamp.	No light indicates poor lamp, loose connection or defective switch S-109.
Keyer operation.	Observe panel meter.	Check grid and plate current of keyer output tube V-111. Normal grid reading is 1.2 ma., plate is 85 ma.
Semi-Operating controls.	Observe panel meter.	With the Metering switch set at Input set the TEST-OPERATE switch alternately at Space, Mark and Carrier. Panel meter should read 2.5 volts difference between Mark and Space, Carrier should be one-half way between these two points.

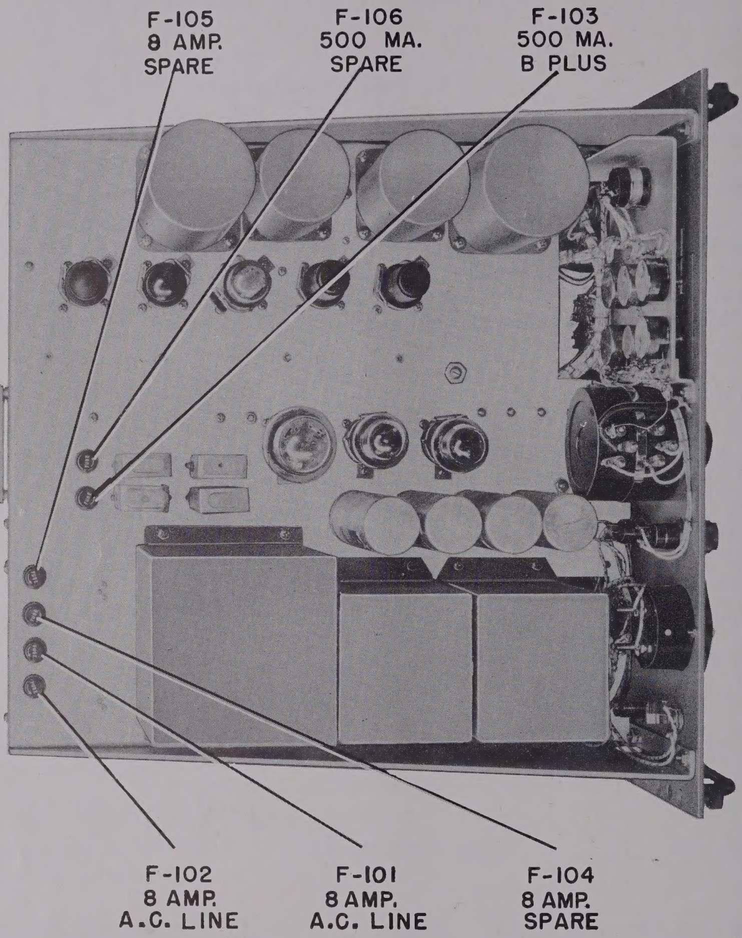


Figure 5–1. Fuse Locations, Modulator-Power Supply MD-165/URT

2. EMERGENCY MAINTENANCE.

Notice to Operators

Operators shall not perform any of the following emergency maintenance procedures without proper authorization.

The maintenance procedure listed in the following paragraphs are for the guidance of operating personnel during an emergency when maintenance personnel are not available.

a. FUSES.–See Figure 5–1 for location of fuses.

CAUTION

Never replace a fuse with one of a higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been corrected.

If the keyer is inoperative and no pilot lamps are lighted check the A.C. power fuse F-102 which is accessible at the rear of the MD-165/URT. Probable cause of A.C. power fuse failure is a short circuit in the primary of the power transformer or the filament

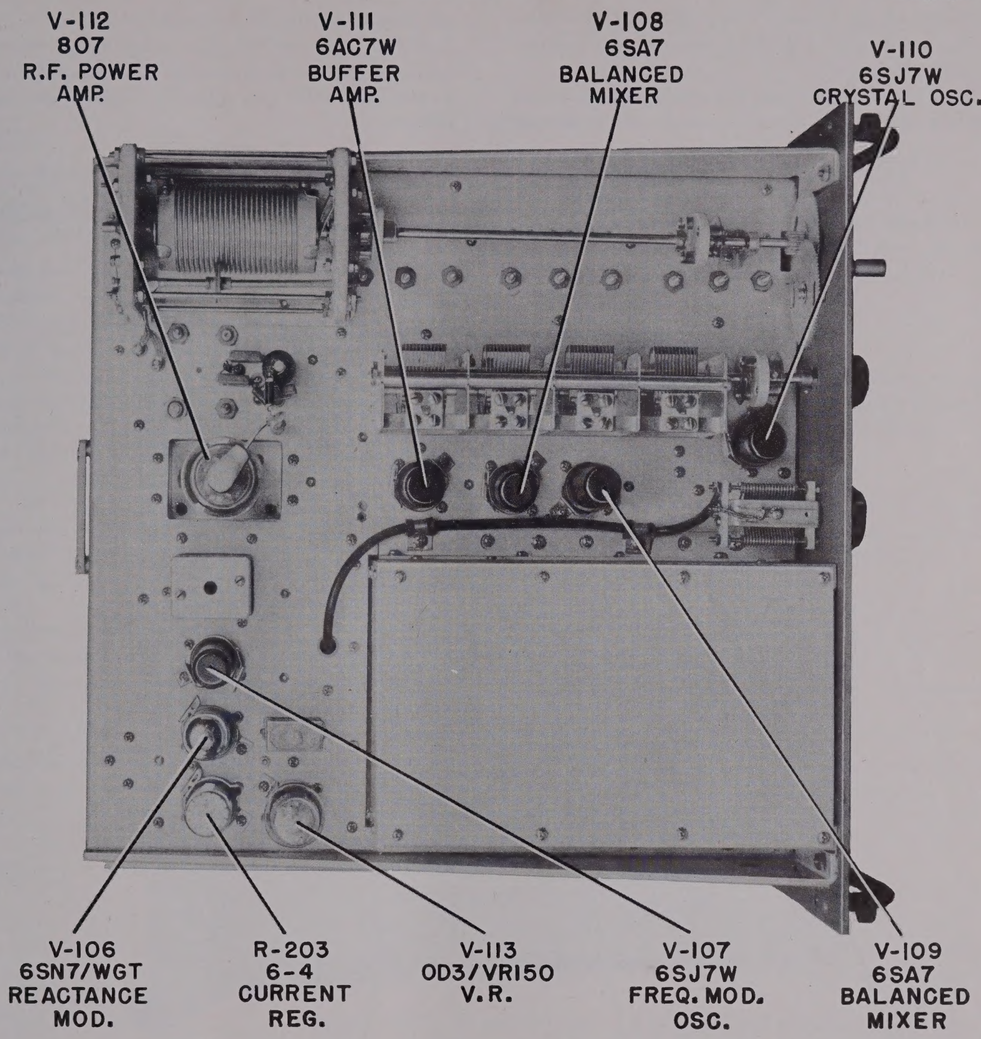


Figure 5–2. Tube Locations, Amplifier-Oscillator AM-655/URT

circuit. If all pilot lamps are lighted but the amber jewel oven lamp, check fuse F-101 which is located at the rear of the MD-165/URT. Probable cause of fuse failure is an open A.C. circuit or shorted A.C. supply to the crystal oven. If the keyer is inoperative and all pilot lamps are lighted check the B+ fuse F-103 located at the rear of the modulator chassis. Eight-ampere fuses are required in the primary circuit of the power transformer and oven circuits. A 500-ma. fuse is required in the B+ circuit. Spare fuses are mounted at the rear of the MD-165/URT.

b. ELECTRON TUBES.–All electron tubes employed in the keyer are located and identified on Figures 5–2 and 5–3. If a particular tube is burned out, as observed by the absence of heater or filament glow, the tube can be replaced by a tube of proven quality. To gain access to the tubes it is necessary to slide the chassis out of the cabinet. To do so, proceed as follows:

(1) Loosen the captive type thumb screws at the outer edges of the front panel.

(2) Grasp the handles located on the front panel and pull the chassis forward as far as the release mechanism will permit. At this point the slide release mechanism on both sides of the chassis will drop into slotted grooves, thus locking the chassis in place and preventing forward or backward movement of the chassis.

Before attempting to remove a tube be sure to loosen the clamp about the base of the tube. To loosen the clamp, insert a screw-driver in the slotted opening at the top of the ring and turn in a counterclockwise direction.

If it becomes necessary to replace the reactance modulator tube V-106, it will be necessary to recheck the modulator alignment as outlined in section 7 para. 5 a. (2). Depress the slide release mechanism and push the chassis back into the cabinet until the positioning pin falls into place. Tighten the captive screws.

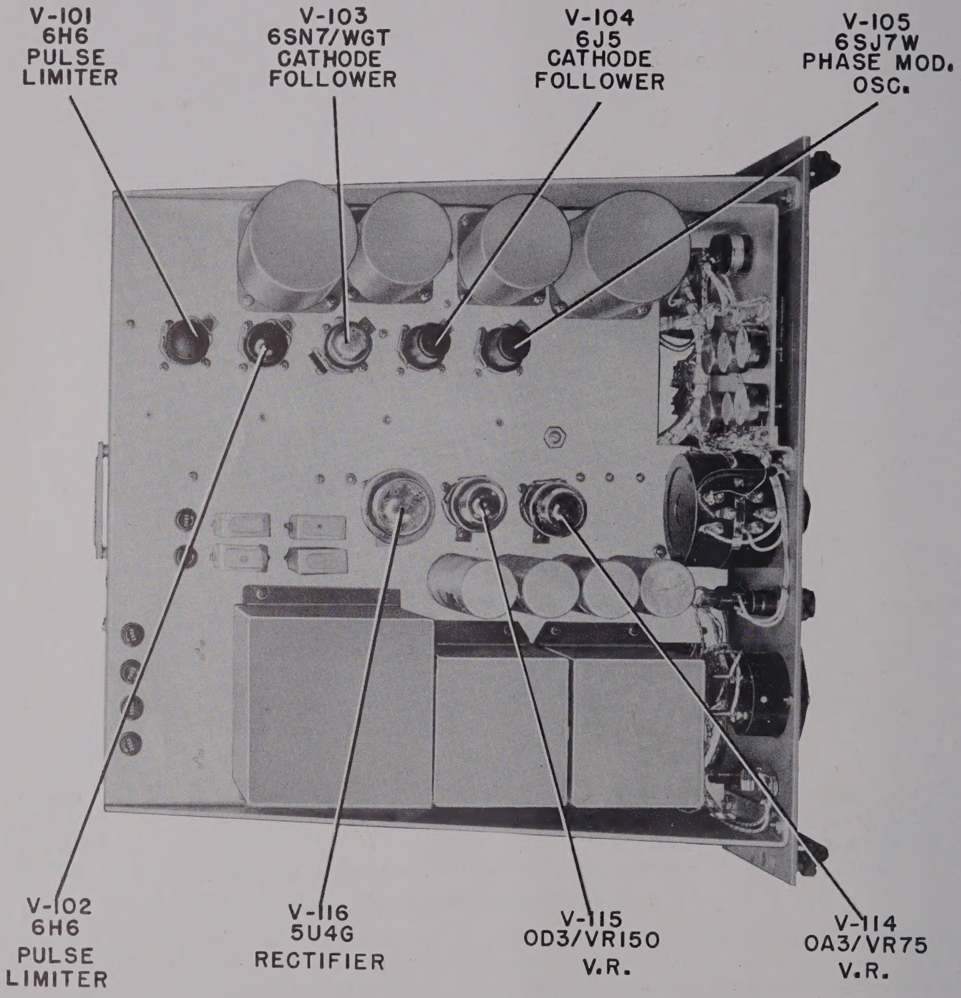


Figure 5–3. Tube Locations, Modulator-Power Supply MD-165/URT

SECTION 6
PREVENTIVE MAINTENANCE

1. ROUTINE MAINTENANCE CHECKS.

Preventive maintenance is a systematic series of operations performed at regular intervals on equipment to eliminate major breakdowns and unwanted interruptions in service and to keep equipment operating at top efficiency. The usefulness of a frequency-shift system depends on each piece of equipment operating at peak efficiency at all times.

The routine maintenance test schedule should be modified if the equipment is used under adverse operating conditions but, in general, the test schedule as arranged in table 6–1 should prove adequate.

NOTE

The attention of maintenance personnel is invited to the requirements of chapter 67 of the Bureau of Ships Manual of the latest issue.

TABLE 6–1. ROUTINE MAINTENANCE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
EACH WATCH		
Refer to Table 5–1. Operator's Routine Check Chart.		
MONTHLY		
1. External connections and cables.	Inspect firmness of all connections to the keyer. Check that the cables have not been damaged.	Loose connections or damaged cables may result in faulty operation.
General visual inspection.	Withdraw the AM-655/URT and MD-165/URT units from the cabinet.	
	Note condition of resistors.	A scorched or discolored exterior indicates replacement is necessary.
	Check all internal connections for evidence of looseness.	Tighten as necessary.
	Inspect relay contacts.	Clean or replace as necessary.
	Inspect all connectors on blister assemblies for evidence of loose or defective connections.	Tighten or replace as necessary.
	Measure insulation resistance of cables to shield and to ground.	It should be at least 2000 megohms.
ANNUALLY		
Electrical performance check.	Complete performance tests as outlined in section 7 para. 4. (c).	

2. LUBRICATION.

The keyer has been lubricated at the factory and requires no added lubrication.

FAILURE REPORTS

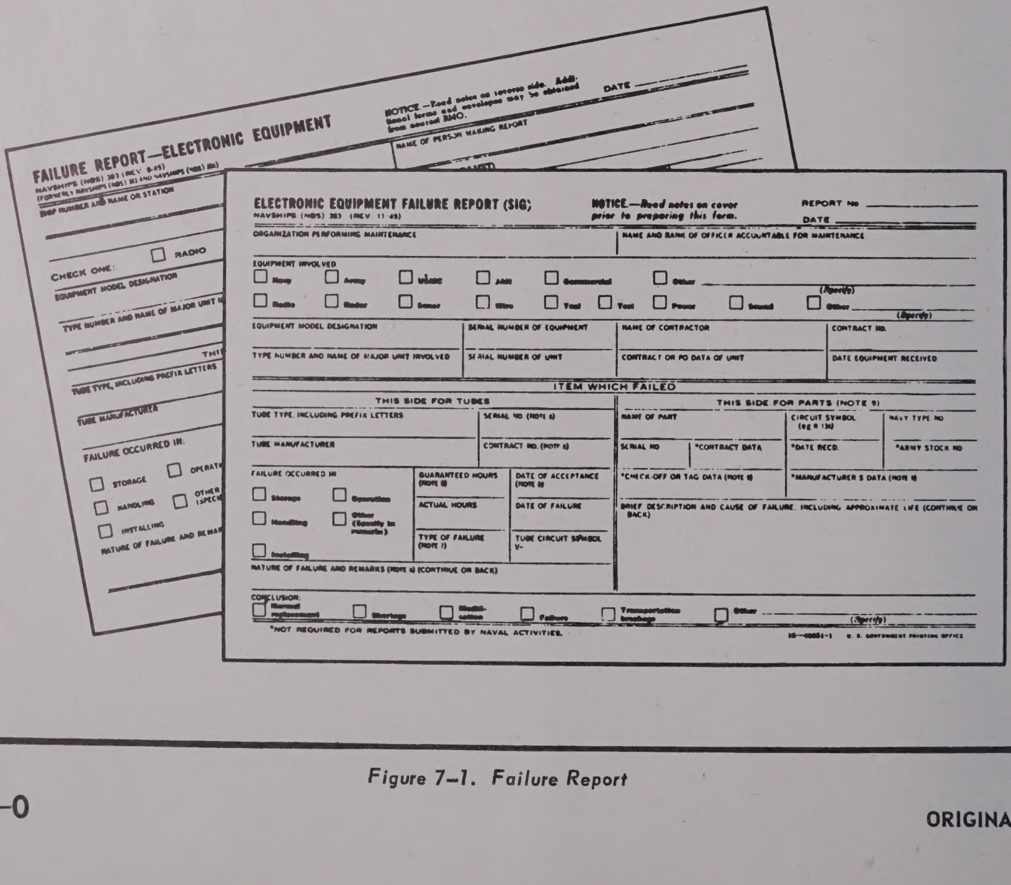
A FAILURE REPORT must be filled out for the failure of any part of the equipment whether caused by defective or worn parts, improper operation, or external influences. It should be made on Failure Report, form NBS-383, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS in the franked envelope which is provided. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example, under "Circuit Symbol" use the proper circuit identification taken from the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the cause and rate of failures. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from any Publications and Distribution Office.



FAILURE REPORT—ELECTRONIC EQUIPMENT
NAVSHIPS (NBS) 383 (REV. 8-45)
(FORMERLY NAVSHIPS (NBS) 383 AND NAVSHIPS (NBS) [illegible])
NOTICE.—Read notes on reverse side. Additional forms and envelopes may be obtained from nearest RMO.
DATE
SHIP NUMBER AND NAME OR STATION
NAME OF PERSON MAKING REPORT
CHECK ONE: ☐ RADIO
EQUIPMENT MODEL DESIGNATION
TYPE NUMBER AND NAME OF MAJOR UNIT
TUBE TYPE, INCLUDING PREFIX LETTERS
TUBE MANUFACTURER
FAILURE OCCURRED IN:
☐ STORAGE ☐ OPERAT
☐ HANDLING ☐ OTHER (SPECI
☐ INSTALLING
NATURE OF FAILURE AND REMAR

ELECTRONIC EQUIPMENT FAILURE REPORT (SIG)
NAVSHIPS (NBS) 383 (REV. 11-45)
NOTICE.—*Read notes on cover prior to preparing this form.*
REPORT No ____
DATE ____
ORGANIZATION PERFORMING MAINTENANCE
NAME AND RANK OF OFFICER ACCOUNTABLE FOR MAINTENANCE
EQUIPMENT INVOLVED
☐ Navy ☐ Army ☐ USMC ☐ AAF ☐ Commercial ☐ Other ____ (*Specify*)
☐ Radio ☐ Radar ☐ Sonar ☐ Wire ☐ Test ☐ Test ☐ Power ☐ Sound ☐ Other ____ (*Specify*)
EQUIPMENT MODEL DESIGNATION
SERIAL NUMBER OF EQUIPMENT
NAME OF CONTRACTOR
CONTRACT NO.
TYPE NUMBER AND NAME OF MAJOR UNIT INVOLVED
SERIAL NUMBER OF UNIT
CONTRACT OR PO DATA OF UNIT
DATE EQUIPMENT RECEIVED
ITEM WHICH FAILED
THIS SIDE FOR TUBES
TUBE TYPE, INCLUDING PREFIX LETTERS
SERIAL NO (NOTE 8)
TUBE MANUFACTURER
CONTRACT NO. (NOTE 8)
FAILURE OCCURRED IN
☐ Storage ☐ Operation
☐ Handling ☐ Other (Specify in remarks)
☐ Installing
GUARANTEED HOURS (NOTE 8)
DATE OF ACCEPTANCE (NOTE 8)
ACTUAL HOURS
DATE OF FAILURE
TYPE OF FAILURE (NOTE 7)
TUBE CIRCUIT SYMBOL V-
NATURE OF FAILURE AND REMARKS (NOTE 6) (CONTINUE ON BACK)
THIS SIDE FOR PARTS (NOTE 9)
NAME OF PART
CIRCUIT SYMBOL (eg R 136)
NAVY TYPE NO
SERIAL NO
*CONTRACT DATA
*DATE RECD.
*ARMY STOCK NO
*CHECK-OFF OR TAG DATA (NOTE 9)
*MANUFACTURER'S DATA (NOTE 9)
BRIEF DESCRIPTION AND CAUSE OF FAILURE, INCLUDING APPROXIMATE LIFE (CONTINUE ON BACK)
CONCLUSION:
☐ Normal replacement ☐ Shortage ☐ Modification ☐ Failure ☐ Transportation breakage ☐ Other ____ (*Specify*)
*NOT REQUIRED FOR REPORTS SUBMITTED BY NAVAL ACTIVITIES.
[illegible] U. S. GOVERNMENT PRINTING OFFICE

Figure 7–1. Failure Report

SECTION 7
CORRECTIVE MAINTENANCE

1. FAILURE REPORT.

A failure report must be filled out for the failure of any part of the equipment. It is to be sent through the proper channels according to the instructions thereon. See Figure 7-1.

WARNING

THIS EQUIPMENT IS CONNECTED ELECTRICALLY TO A TRANSMITTER EMPLOYING VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING WITH THE EQUIPMENT.

2. INTRODUCTION.

This section contains all information necessary for the repair and adjustment of the keyer. Maintenance personnel must be prepared to repair and adjust keyers that have failed in operation. The source of the trouble must be located, the defect remedied and the equipment restored to an operating condition.

Contained in this section is a trouble-shooting paragraph to serve as a guide to maintenance personnel in locating the source of trouble and its possible cause. Following this, is a paragraph giving detailed instructions for all electrical alignment procedures and adjustments. Finally, a paragraph is included for guidance when making mechanical repairs or adjustments.

3. THEORY OF LOCALIZATION.

The manner in which the keyer operates, or fails to operate, often gives unmistakeable indications of the source of trouble. For example, abnormal action of a control will in most cases indicate the specific stage or stages at fault. The production of satisfactory keying or facsimile signals depends not only upon the successful operation of the keyer itself, but also upon the character of the signals connected to it. Furthermore, if an external oscillator is used to generate an R.F. carrier, the stability and accuracy of the oscillator output influences the reliability of the keyer output.

Figure 7–2 is a trouble shooting chart which lists in logical sequence a series of checks to be made to locate quickly the specific circuit causing faulty keyer operation. The trouble shooting chart does not list all possible troubles. However, it does list those that are most likely to occur. In most cases, the use of the chart will localize a source of trouble sufficiently well to enable its precise location by voltage and resistance checks in the suspected area.

4. TROUBLE SHOOTING.

a. GENERAL.—The location of troubles in the keyer can be accomplished by making the series of checks outlined on the trouble shooting chart, Figure 7–2. To read this chart start at the left hand side and follow the heavy black line to the right. An 'ok' following a specific circuit signifies that this circuit is operating properly and the maintenance man may proceed to the next stage. If a particular circuit is inoperative a series of checks pertaining to that circuit is shown in lighter lines adjacent to its position on the chart. A six-foot three-inch service cable W-109 is supplied with the KY-75/SRT to enable the maintenance man to remove the individual chassis from the cabinet and service the unit on a test bench. To use this cable connect it between the connector on the inside of the cabinet and the connector on the chassis being serviced. Refer to para. 5. (1) for the method of removing the chassis from the KY-58/GRT. Tubes should be checked in suitable tube testing equipment or by replacement with tubes of proven quality. Specific stages and their components can be checked by performing voltage and resistance measurements as outlined in Figures 7–3 and 7–4. Constant reference to the schematic diagram Figure 7–21 and the practical wiring diagram, Figures 7–22, 7–23 and 7–32 is required for efficient trouble shooting. A thorough inspection of the keyer and its external connections should be made before attempting any adjustments or repairs.

The presence or conditions of keying voltages may be checked with suitable voltage measurements of the keying input lines. If an oscilloscope such as

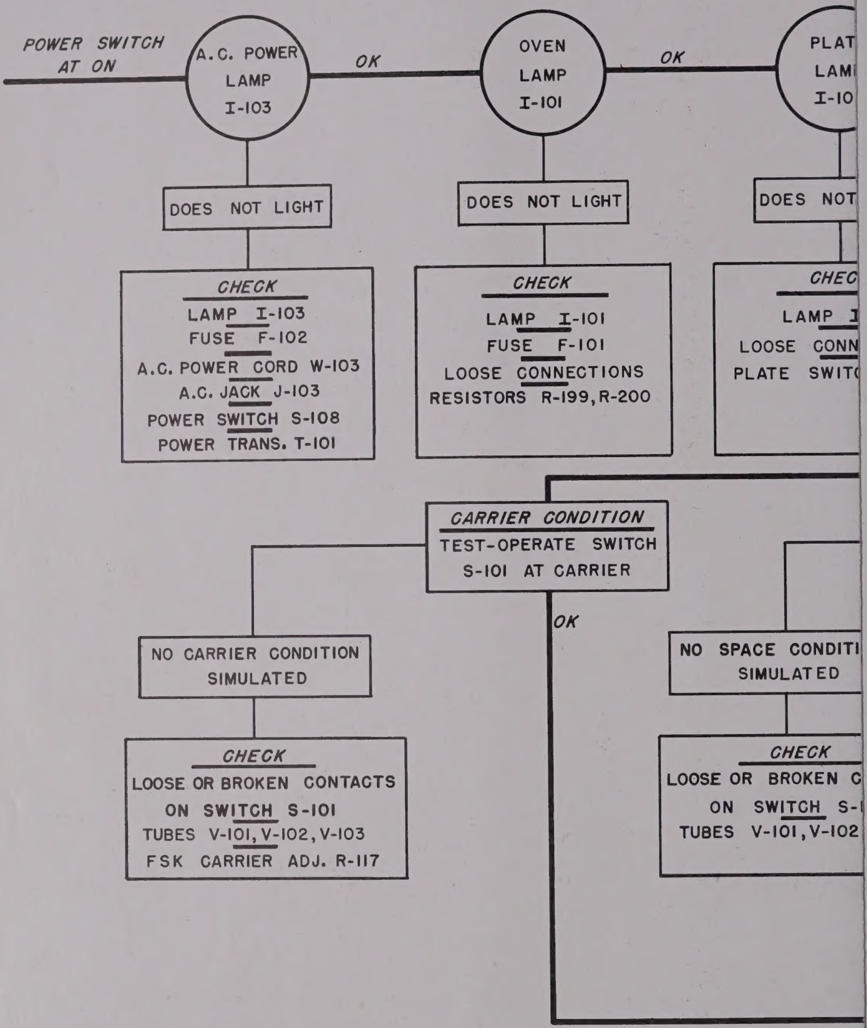
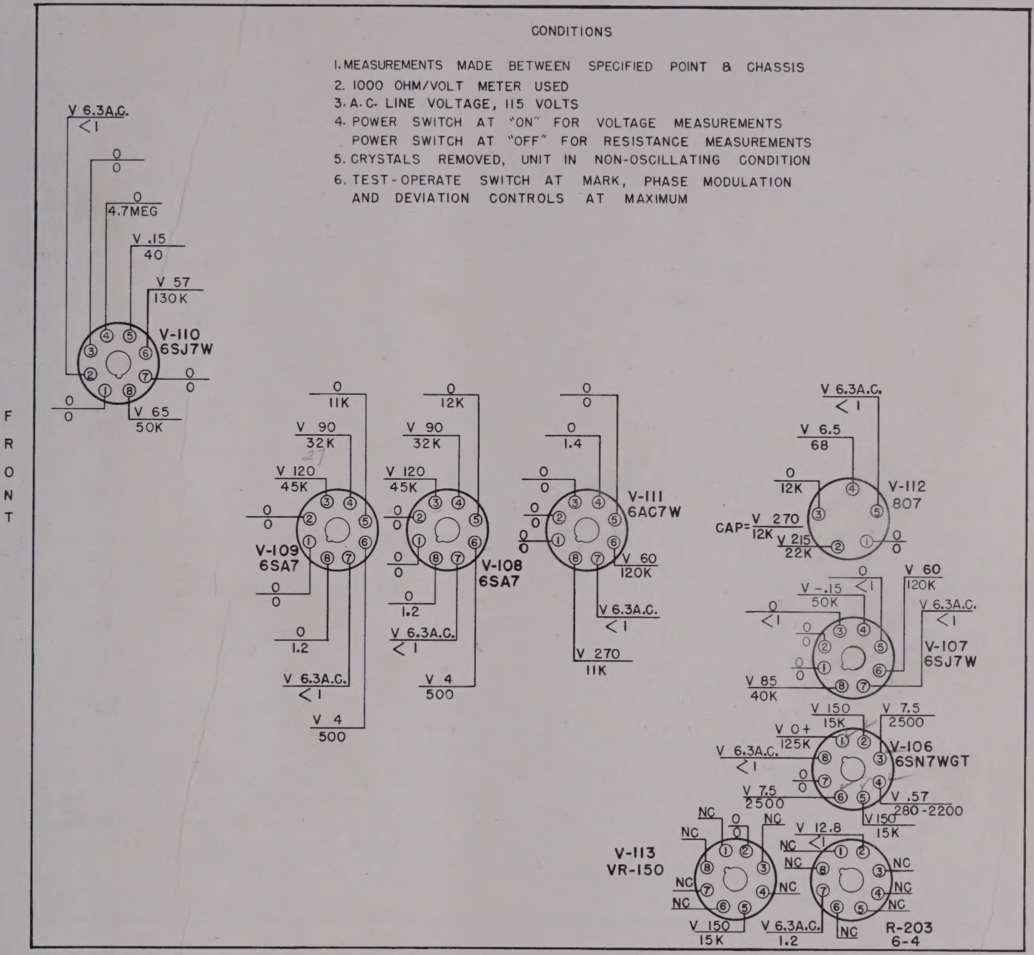


Figure 7–2. Trouble Shooting Chart



CONDITIONS

1. MEASUREMENTS MADE BETWEEN SPECIFIED POINT & CHASSIS
2. 1000 OHM/VOLT METER USED
3. A.C. LINE VOLTAGE, 115 VOLTS
4. POWER SWITCH AT "ON" FOR VOLTAGE MEASUREMENTS POWER SWITCH AT "OFF" FOR RESISTANCE MEASUREMENTS
5. CRYSTALS REMOVED, UNIT IN NON-OSCILLATING CONDITION
6. TEST-OPERATE SWITCH AT MARK, PHASE MODULATION AND DEVIATION CONTROLS AT MAXIMUM

Figure 7–3. Voltage and Resistance Data Chart, Amplifier-Oscillator AM-655/URT

Navy Model OBL series, OBT series or equivalent is available, the keying impluses may be checked visually while running Morse dots or running an RY tape in the teletype transmitter by connecting the vertical input to the keyer line terminal and using a slow-speed sweep.

b. CIRCUIT CONSTANTS.—The value of all circuit components are indicated on the Parts List, Table 8–4 and on the schematic diagram, Figure 7–21. Their actual connections and approximate locations are shown on the practical wiring diagram Figures 7–22, 7–23 and 7–32. Their actual locations are shown on Figures 7–24 through 7–31.

c. PERFORMANCE TESTS.—The following tests are used to check operation of the keyer section by section. These tests should be made following any readjustments or repairs to assure proper functioning of the keyer prior to its return to operational duty. The tests must be made in the order shown since the test of any specific section of the keyer is predicated on the fact that sections prior to the section under test have been checked and found to be functioning properly.

Units of test equipment required to perform these tests are as follows:

An R.F. frequency meter such as Navy Model LM series or equivalent.

A 5 to 20-volt battery source.

A high frequency receiver, National Co. Model NC-240D or equivalent.

A 10 kc. Multivibrator, General Radio Co. Model 692B or equivalent.

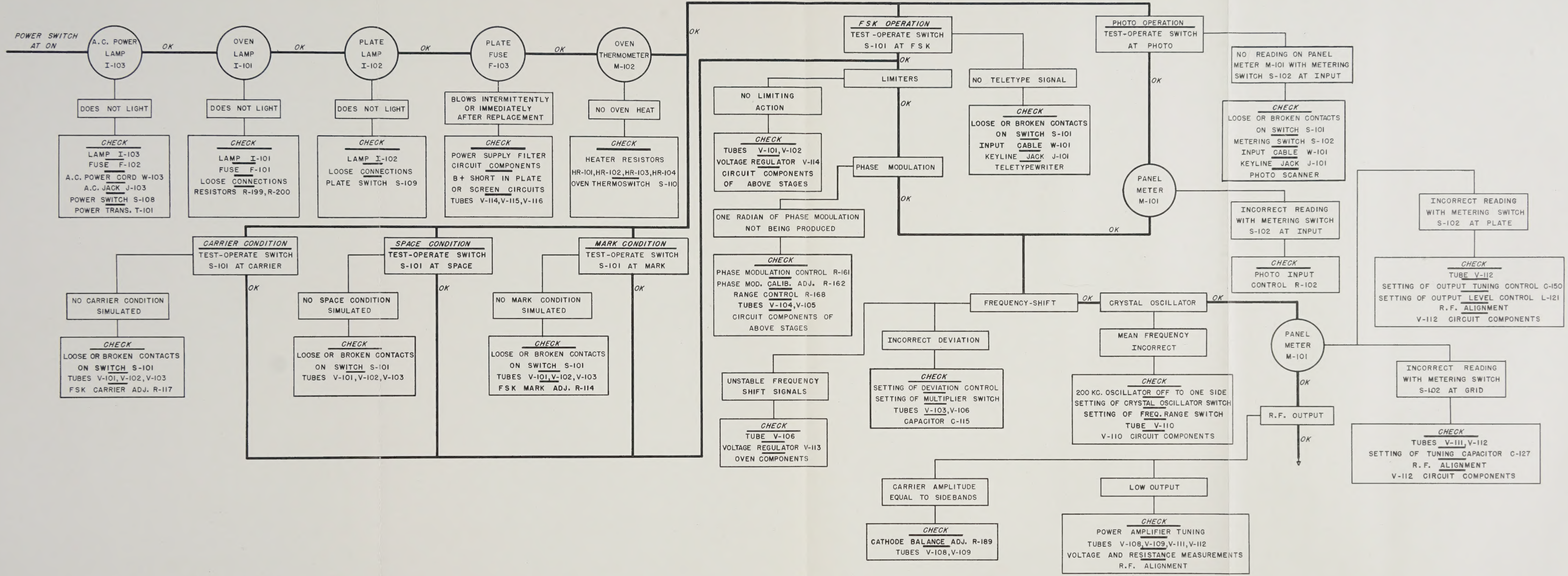
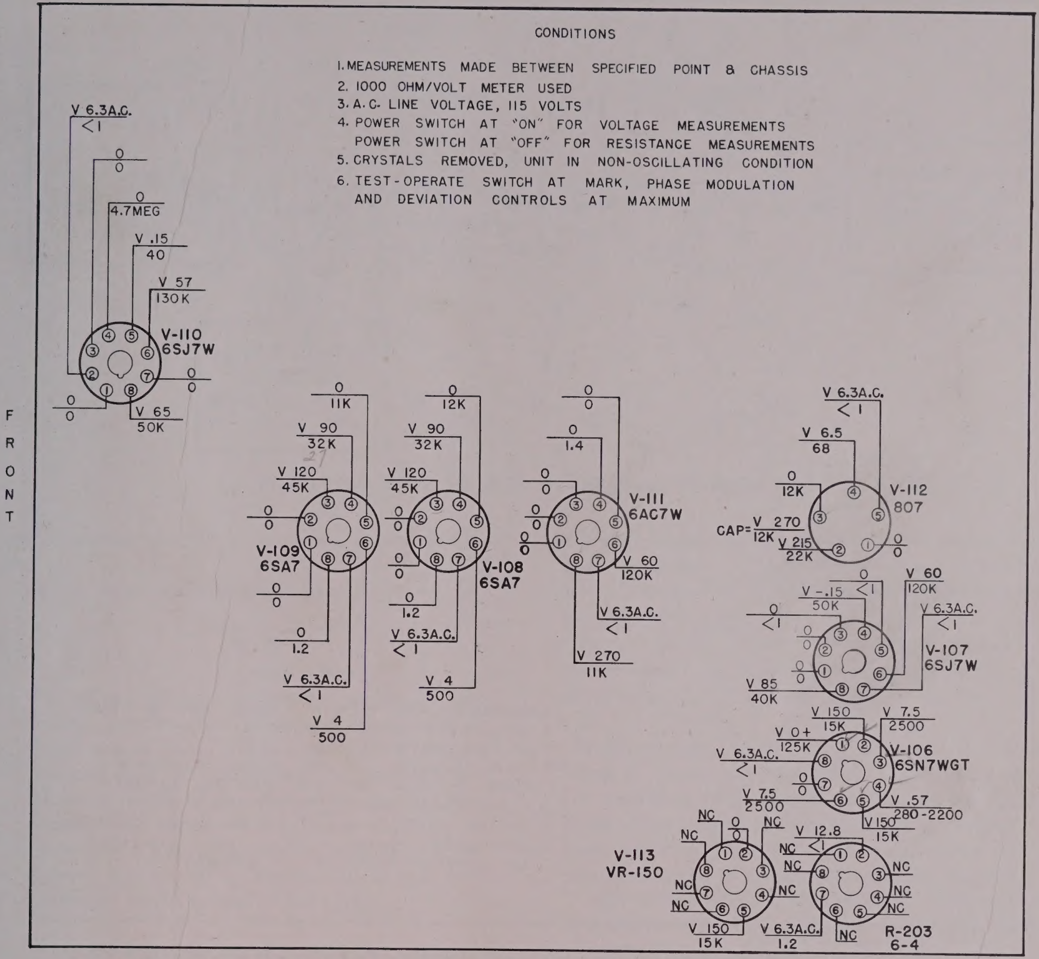

POWER SWITCH AT ON
A.C. POWER LAMP I-103
OK
OVEN LAMP I-101
OK
PLATE LAMP I-102
OK
PLATE FUSE F-103
OK
OVEN THERMOMETER M-102
OK
DOES NOT LIGHT
CHECK
LAMP I-103
FUSE F-102
A.C. POWER CORD W-103
A.C. JACK J-103
POWER SWITCH S-108
POWER TRANS. T-101
DOES NOT LIGHT
CHECK
LAMP I-101
FUSE F-101
LOOSE CONNECTIONS
RESISTORS R-199, R-200
DOES NOT LIGHT
CHECK
LAMP I-102
LOOSE CONNECTIONS
PLATE SWITCH S-109
BLOWS INTERMITTENTLY OR IMMEDIATELY AFTER REPLACEMENT
CHECK
POWER SUPPLY FILTER CIRCUIT COMPONENTS
B+ SHORT IN PLATE OR SCREEN CIRCUITS
TUBES V-114, V-115, V-116
NO OVEN HEAT
CHECK
HEATER RESISTORS
HR-101, HR-102, HR-103, HR-104
OVEN THERMOSWITCH S-110
CARRIER CONDITION
TEST-OPERATE SWITCH S-101 AT CARRIER
OK
NO CARRIER CONDITION SIMULATED
CHECK
LOOSE OR BROKEN CONTACTS ON SWITCH S-101
TUBES V-101, V-102, V-103
FSK CARRIER ADJ. R-117
SPACE CONDITION
TEST-OPERATE SWITCH S-101 AT SPACE
OK
NO SPACE CONDITION SIMULATED
CHECK
LOOSE OR BROKEN CONTACTS ON SWITCH S-101
TUBES V-101, V-102, V-103
MARK CONDITION
TEST-OPERATE SWITCH S-101 AT MARK
OK
NO MARK CONDITION SIMULATED
CHECK
LOOSE OR BROKEN CONTACTS ON SWITCH S-101
TUBES V-101, V-102, V-103
FSK MARK ADJ. R-114
OK
FSK OPERATION
TEST-OPERATE SWITCH S-101 AT FSK
OK
LIMITERS
OK
NO LIMITING ACTION
CHECK
TUBES V-101, V-102
VOLTAGE REGULATOR V-114
CIRCUIT COMPONENTS OF ABOVE STAGES
PHASE MODULATION
OK
ONE RADIAN OF PHASE MODULATION NOT BEING PRODUCED
CHECK
PHASE MODULATION CONTROL R-161
PHASE MOD. CALIB. ADJ. R-162
RANGE CONTROL R-168
TUBES V-104, V-105
CIRCUIT COMPONENTS OF ABOVE STAGES
NO TELETYPE SIGNAL
CHECK
LOOSE OR BROKEN CONTACTS ON SWITCH S-101
INPUT CABLE W-101
KEYLINE JACK J-101
TELETYPEWRITER
PHOTO OPERATION
TEST-OPERATE SWITCH AT PHOTO
OK
NO READING ON PANEL METER M-101 WITH METERING SWITCH S-102 AT INPUT
CHECK
LOOSE OR BROKEN CONTACTS ON SWITCH S-101
METERING SWITCH S-102
INPUT CABLE W-101
KEYLINE JACK J-101
PHOTO SCANNER
PANEL METER M-101
OK
INCORRECT READING WITH METERING SWITCH S-102 AT INPUT
CHECK
PHOTO INPUT CONTROL R-102
INCORRECT READING WITH METERING SWITCH S-102 AT PLATE
CHECK
TUBE V-112
SETTING OF OUTPUT TUNING CONTROL C-150
SETTING OF OUTPUT LEVEL CONTROL L-121
R.F. ALIGNMENT
V-112 CIRCUIT COMPONENTS
FREQUENCY-SHIFT
OK
CRYSTAL OSCILLATOR
OK
UNSTABLE FREQUENCY SHIFT SIGNALS
CHECK
TUBE V-106
VOLTAGE REGULATOR V-113
OVEN COMPONENTS
INCORRECT DEVIATION
CHECK
SETTING OF DEVIATION CONTROL
SETTING OF MULTIPLIER SWITCH
TUBES V-103, V-106
CAPACITOR C-115
MEAN FREQUENCY INCORRECT
CHECK
200 KC. OSCILLATOR OFF TO ONE SIDE
SETTING OF CRYSTAL OSCILLATOR SWITCH
SETTING OF FREQ. RANGE SWITCH
TUBE V-110
V-110 CIRCUIT COMPONENTS
PANEL METER M-101
OK
INCORRECT READING WITH METERING SWITCH S-102 AT GRID
CHECK
TUBES V-111, V-112
SETTING OF TUNING CAPACITOR C-127
R.F. ALIGNMENT
V-112 CIRCUIT COMPONENTS
R.F. OUTPUT
OK
CARRIER AMPLITUDE EQUAL TO SIDEBANDS
CHECK
CATHODE BALANCE ADJ. R-189
TUBES V-108, V-109
LOW OUTPUT
CHECK
POWER AMPLIFIER TUNING
TUBES V-108, V-109, V-111, V-112
VOLTAGE AND RESISTANCE MEASUREMENTS
R.F. ALIGNMENT

Figure 7-2. Trouble Shooting Chart



CONDITIONS

1. MEASUREMENTS MADE BETWEEN SPECIFIED POINT & CHASSIS
2. 1000 OHM/VOLT METER USED
3. A.C. LINE VOLTAGE, 115 VOLTS
4. POWER SWITCH AT "ON" FOR VOLTAGE MEASUREMENTS
POWER SWITCH AT "OFF" FOR RESISTANCE MEASUREMENTS
5. CRYSTALS REMOVED, UNIT IN NON-OSCILLATING CONDITION
6. TEST-OPERATE SWITCH AT MARK, PHASE MODULATION AND DEVIATION CONTROLS AT MAXIMUM

Figure 7–3. Voltage and Resistance Data Chart, Amplifier-Oscillator AM-655/URT

Navy Model OBL series, OBT series or equivalent is available, the keying impluses may be checked visually while running Morse dots or running an RY tape in the teletype transmitter by connecting the vertical input to the keyer line terminal and using a slow-speed sweep.

b. CIRCUIT CONSTANTS.–The value of all circuit components are indicated on the Parts List, Table 8–4 and on the schematic diagram, Figure 7–21. Their actual connections and approximate locations are shown on the practical wiring diagram Figures 7–22, 7–23 and 7–32. Their actual locations are shown on Figures 7–24 through 7–31.

c. PERFORMANCE TESTS.–The following tests are used to check operation of the keyer section by section. These tests should be made following any readjustments or repairs to assure proper functioning of the keyer prior to its return to operational duty. The tests must be made in the order shown since the test of any specific section of the keyer is predicated on the fact that sections prior to the section under test have been checked and found to be functioning properly.

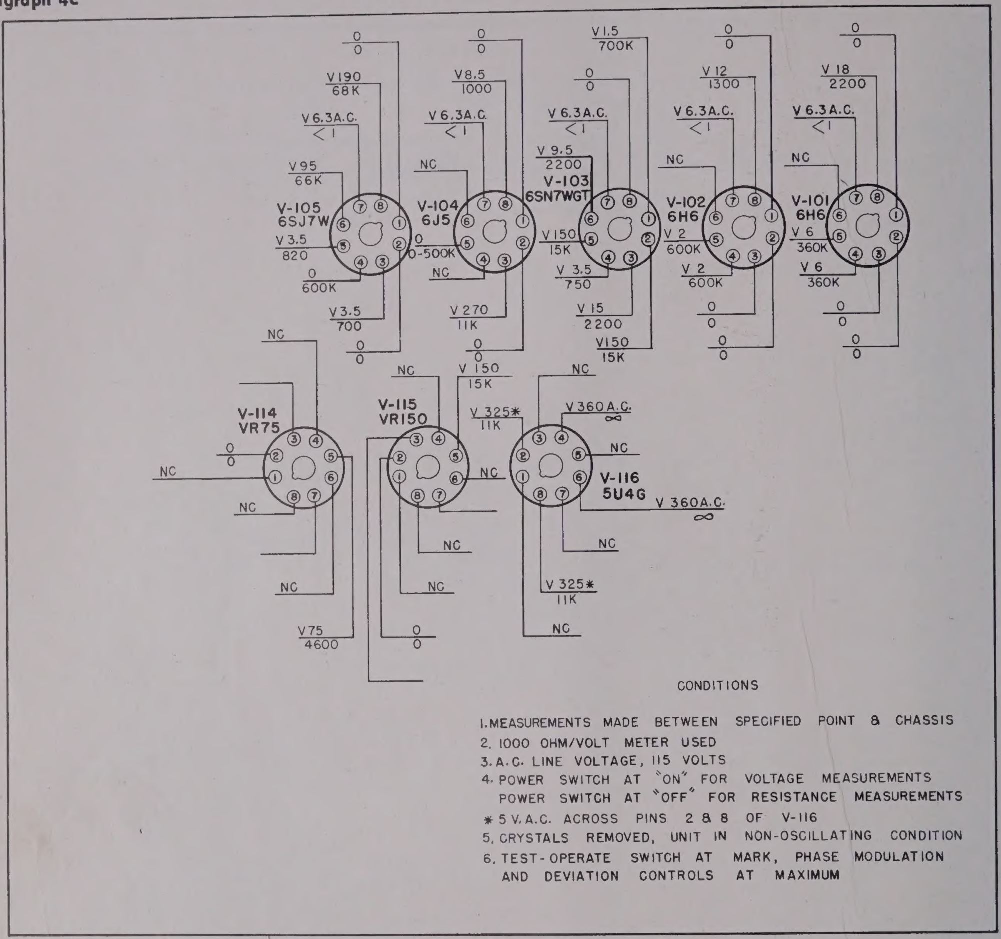
Units of test equipment required to perform these tests are as follows:

An R.F. frequency meter such as Navy Model LM series or equivalent.

A 5 to 20-volt battery source.

A high frequency receiver, National Co. Model NC-240D or equivalent.

A 10 kc. Multivibrator, General Radio Co. Model 692B or equivalent.



CONDITIONS

1. MEASUREMENTS MADE BETWEEN SPECIFIED POINT & CHASSIS
2. 1000 OHM/VOLT METER USED
3. A.C. LINE VOLTAGE, 115 VOLTS
4. POWER SWITCH AT "ON" FOR VOLTAGE MEASUREMENTS
POWER SWITCH AT "OFF" FOR RESISTANCE MEASUREMENTS
* 5 V.A.C. ACROSS PINS 2 & 8 OF V-116
5. CRYSTALS REMOVED, UNIT IN NON-OSCILLATING CONDITION
6. TEST-OPERATE SWITCH AT MARK, PHASE MODULATION AND DEVIATION CONTROLS AT MAXIMUM

Figure 7–4. Voltage and Resistance Data Chart, Modulator-Power Supply MD-165/URT

A variable audio oscillator, Navy Model LO series or equivalent.

An oscilloscope, such as Navy Model OBL series or equivalent.

(1) TEMPERATURE REGULATION.

Step 1. When the amber pilot lamp lights, observe that the oven thermometer reads slightly less than 70°C.

Step 2. Verify that the temperature heating cycle, averaged over five successive cycles, is on for approximately two minutes and off for approximately ten minutes under normal ambient room temperature of approximately 30°C.

(2) 200 KC. OSCILLATOR.

Step 1. Connect cable W-107 between the keyer FREQUENCY METER R.F. OUTPUT jack J-110 and the input of a frequency meter such as Navy Model LM or equivalent.

Step 2. After the oven has reached its operating temperature of 70°C set the CRYSTAL-OSC. switch at the desired crystal position. Set the TEST-OPERATE switch at carrier.

Step 3. Set the METERING switch at GRID. Set the FREQ. RANGE switch at the position encompassing the keyer output frequency. Set the TUNING control at a position 200 kc. above the crystal frequency and carefully adjust it about this setting for the maximum meter reading.

Step 4. Adjust the frequency meter until the keyer output frequency is found. Note the output frequen-

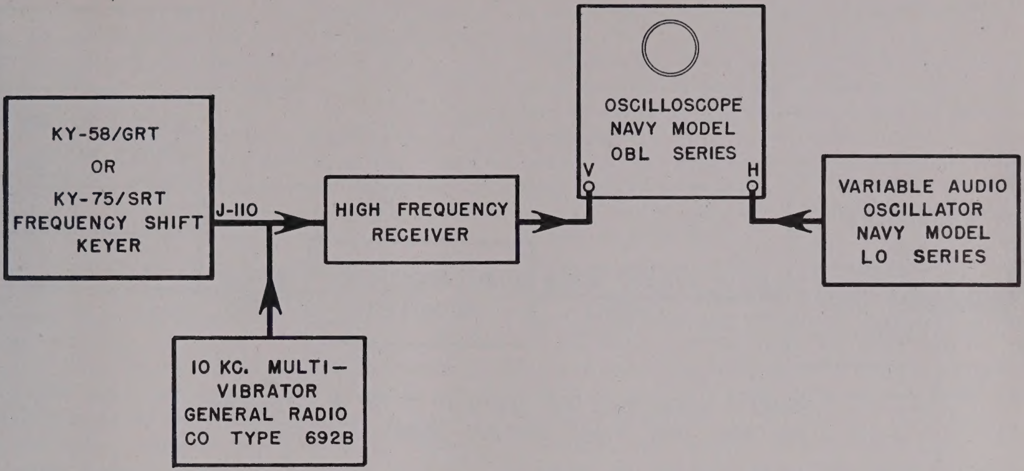


Figure 7–5. Interconnections for Frequency Deviation Test

cy. It should be 200 kc. above the crystal frequency.

Step 5. Remove the frequency meter.

NOTE

As an alternate an accurately calibrated receiver covering the frequency range of the keyer can be used. This receiver can be utilized to make the above check by loosely coupling the output of the keyer to the input of the receiver and tuning the receiver to the keyer's frequency. The frequency as read on the receivers dial should be 200 kcs. higher than the frequency of the crystal in the keyer.

(3) FREQUENCY DEVIATION FOR FREQUENCY-SHIFT TRANSMISSION.—See Figure 7–5 for the method of connecting the equipment required for this test.

Step 1. Adjust the receiver controls for MCW Operation.

Step 2. Tune the receiver until the audio tone is heard in the audio output of the receiver. Adjust the Audio Gain and R.F. Gain controls of the receiver for a suitable output.

Step 3. Set the DEVIATION control at 10 (maximum deviation).

Step 4. Set the MULTIPLIER switch at X1.

Step 5. Set the TEST-OPERATE switch at CARRIER.

Step 6. Adjust the variable audio oscillator until a 1:1 frequency pattern (a circular trace) appears on the oscilloscope screen. Note the frequency of the audio oscillator. Check this frequency against the crystal frequency. It should be the crystal frequency plus 200 kcs.

Step 7. If the frequency does not measure exactly 200 kc. above the crystal frequency adjust the CARRIER CALIBRATE control until this result is obtained.

Step 8. Set the TEST-OPERATE switch at MARK.

Step 9. Adjust the variable audio oscillator until a 1:1 frequency ratio pattern appears on the oscilloscope screen. Note the frequency on the audio oscillator. It should be 500 cycles higher than the frequency obtained in the carrier condition (Step 6).

(4) FREQUENCY DEVIATION FOR PHOTO TRANSMISSION.—The equipment remains connected as outlined in paragraph (3).

Step 1. Set the DEVIATION control at 10 (maximum deviation).

Step 2. Set the MULTIPLIER switch at X1.

Step 3. Set the TEST-OPERATE switch at PHOTO.

Step 4. Set the INPUT FILTER switch at PHOTO.

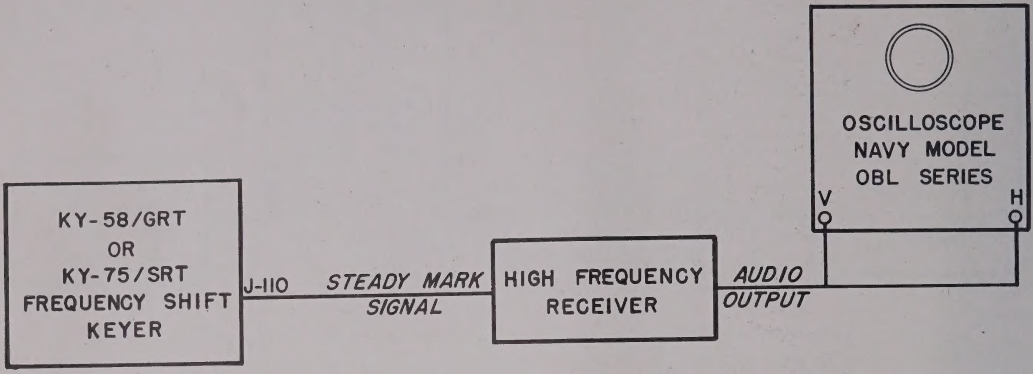
Step 5. Remove the keyer input cable W-101.

Step 6. Connect a battery source of 5 to 20 volts to the keyer input jack J-101.

Step 7. Set the METERING switch at INPUT.

Step 8. Adjust the PHOTO INPUT control until a reading of 2.5 volts is obtained on the front-panel meter. This 2.5 volts is utilized to simulate the photo carrier.

Step 9. Adjust the variable audio oscillator until a 1:1 frequency pattern appears on the oscilloscope screen. Note this frequency. It represents the car-



SWEEP ADJUSTED TO DISPLAY 2 OR 3 CYCLES.
DO NOT USE THE SWEEP SYNC. FEATURE.

Figure 7–6. Interconnections for Phase Modulation Test

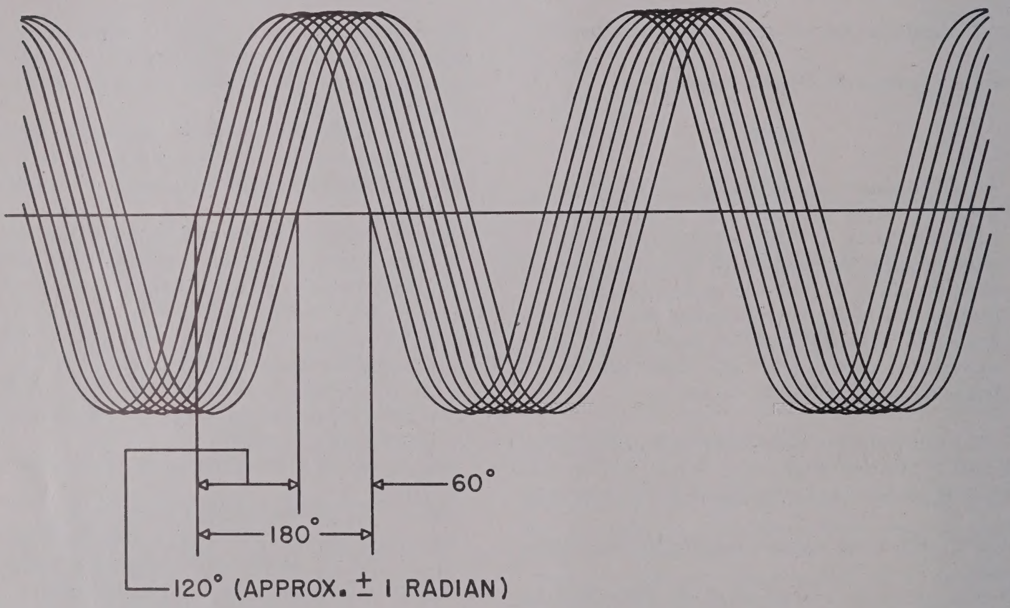


Figure 7–7. Oscilloscope Pattern Representing One Radian of Phase Modulation

rier frequency.

Step 10. Remove the battery source in order to simulate a space condition.

Step 11. Adjust the variable audio oscillator until a 1:1 frequency pattern appears on the oscilloscope screen. Note the frequency. This frequency represents the space condition and should be 1000 cycles lower than the frequency noted in Step 9.

Step 12. Return the battery connections to input jack J-101.

Step 13. Adjust the PHOTO INPUT control until a 5-volt reading is obtained on the front-panel meter. This 5 volts is utilized to produce the photo Mark condition.

Step 14. Adjust the variable audio oscillator until a 1:1 frequency pattern appears on the oscilloscope screen. Note the frequency. This frequency represents the mark condition and should be 1000 cycles higher than the frequency noted in Step 9.

Step 15. Remove all test equipment.

(5) R.F. OUTPUT.

Step 1. Set the CRYSTAL-OSC. switch at the desired position. Set the FREQ. RANGE switch at the position encompassing the keyer output frequency.

Step 2. Set the METERING switch at GRID. Set the TUNING control at a frequency 200 kc. above the crystal frequency and carefully adjust it about this setting for a maximum front-panel meter reading. A normal reading is approximately 1.2 ma. (actual meter reading of 0.4 ma).

Step 3. Set the METERING switch at PLATE. Panel meter should read approximately 85 ma. (actual reading of 0.425 ma) with the plate tuned to resonance and an R.F. Ammeter reading of 285 ma. or the rated power output of 6 watts.

(6) PHASE MODULATION.

Step 1. Make the connections outlined on Figure 7–6.

Step 2. Set the PHASE MODULATION control at one radian (57.3°) and the INPUT FILTER switch at 60. Set the TEST-OPERATE switch at Mark.

Step 3. The pattern observed on the oscilloscope should check with that shown on Figure 7–7.

Step 4. Remove all test equipment.

(7) CARRIER BALANCE.

Step 1. Set the CRYSTAL-OSC. switch at the desired position. Set the FREQ. RANGE switch at a position encompassing the keyer output frequency.

Step 2. Set the METERING switch at PLATE. Turn the TUNING control from minimum to maximum and observe the readings obtained on the panel meter. Three readings should be observed. The balanced carrier should produce a minimum current reading whereas the sidebands on both sides of the carrier should produce maximum current readings with the upper sideband showing a slightly higher reading than the lower sideband. The three readings should be the crystal frequency, the crystal frequency +200 kcs. and the crystal frequency -200 kcs. If the Cathode Balance Adjustment has been accurately set the crystal frequency may not be found.

5. REPAIRS.

a. ALIGNMENT DATA.—This section contains all information necessary to permit maintenance personnel to align the keyer. It is important that the function of each circuit element is understood so that the correct alignment may be obtained quickly and accurately. See Figures 7–8 through 7–12 for location of all alignment adjustments.

The complete alignment of the keyer may be divided into two steps, R.F. alignment and modulator alignment.

The alignment of any adjustment indiscriminately is to be avoided and no circuit should be realigned unless operation definitely indicates that realignment is necessary.

Units of test equipment required to perform these repairs are as follows:

An electronic voltmeter such as Navy Model OBQ or multimeter ME-25/U.

A signal generator, such as Navy Model LAH, R.F. Signal Generator or equivalent, with a frequency coverage that encompasses the 900 to 7000 kc. range.

A Ballantine voltmeter model 300 or equivalent.

A 5 to 20-volt battery source.

An R.F. frequency meter such as Navy Model LM series or equivalent.

A 500-ma. R.F. meter.

An oscilloscope Navy Model OBL series or equivalent.

A 10-kc. multivibrator, General Radio Co. type 692B or equivalent.

A high frequency receiver, National Co. Model NC-240D or equivalent.

A variable audio oscillator, Navy Model LO series or equivalent.

To effect complete alignment of the keyer it is necessary to remove the AM-655/URT and MD-165/URT units from the cabinet. Proceed as follows:

(1) KY-58/GRT.

Step 1. Remove the A.C. input cable W-103 from the A.C. supply source.

Step 2. Loosen the captive type thumb screws on the outer edges of the front panel. Both the AM-655/URT and MD-165/URT are removed in the same manner therefore the following description is applicable to both units.

Step 3. Grasp the handles located on the front panel and pull the chassis forward as far as the release mechanism will permit. At this point the slide release mechanism on both sides of the chassis will drop into slotted grooves, thus locking the chassis in place and preventing forward or backward movement of the chassis.

Step 4. To remove the chassis from the cabinet depress the slide release mechanism on each side of the chassis and pull the chassis forward. Place the chassis on the repair bench or on top of the keyer cabinet.

Step 5. Release the four captivated nuts securing the two blister units in place. Remove the blisters.

Step 6. Connect the blisters to the chassis. There is sufficient slack in the cables to permit moving the blister units at will.

Step 7. Connect the A.C. input cable W-103 be-

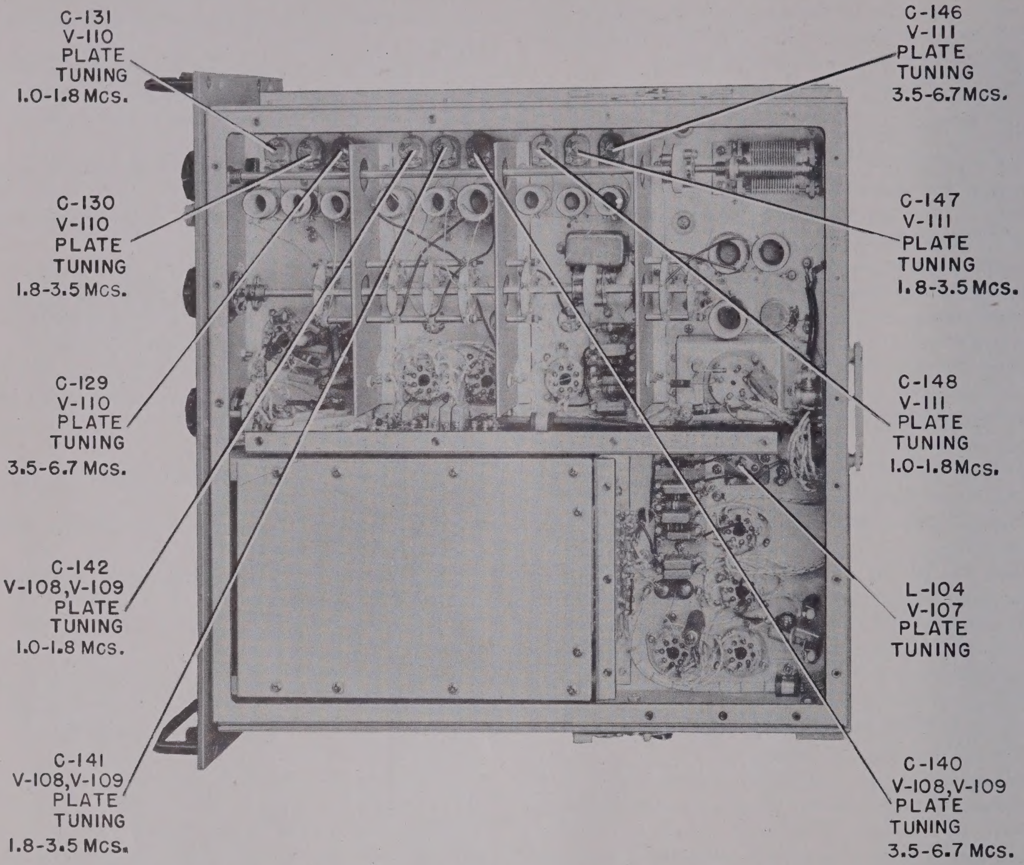


Figure 7–8. Alignment Adjustment Locations, Bottom View of Amplifier-Oscillator AM-655/URT

tween the A.C. input jack J-103 and the A.C. supply source.

Step 8. Connect a 73-ohm non-inductive resistive load to the keyer output jack J-111. Place a 500-milliampere R.F. meter in series with the load.

Step 9. Remove all crystals from their sockets.

(2) KY-75/SRT.—The procedure for removing the KY-75/SRT keyer from its cabinet and preparing it for alignment is similar to that described in para 5 (1) except that a six-foot test cord is supplied to connect the chassis that has been removed from the cabinet. However, in this case it is only possible to remove one chassis at a time. Connect the test cord between the multi-connector on the chassis and the multi-connector on the inside of the cabinet.

The above steps complete the preliminary procedure for setting up the keyer for service and alignment. To effect alignment proceed as follows:

(3) R.F. ALIGNMENT.

(*a*) CRYSTAL OSCILLATOR ALIGNMENT.

Step 1. Connect the signal generator between pin 4 of the crystal oscillator tube V-110 and chassis.

Step 2. Connect the electronic voltmeter (Model OBQ or ME-25/U) between pin 5 of the mixer stage (parallel grids of balanced mixer tubes V-108 and and V-109) and chassis. Set the voltmeter on the 50-volt scale.

Step 3. Set the A.C. POWER switch at ON.

Step 4. Set the PLATE switch at ON.

Step 5. Set the FREQ. RANGE switch at 3.5 - 6.7.

Step 6. Release the lock on the TUNING control and set it at 6.7. Adjust the signal generator for an unmodulated signal output of 2 volts at 6500 kcs. Adjust trimmer capacitor C-129 for maximum reading on the electronic voltmeter.

Step 7. Set the TUNING control at 3.5 Change the frequency setting of the generator to 3300 kcs. Adjust the tuning core of inductor L-106 for maximum reading on the electronic voltmeter.

The above procedure completes the oscillator alignment for the 3.5 to 6.7 range.

Step 8. To align the oscillator on the 1.8 to 3.5 mc. range set the FREQ. RANGE switch at 1.8 - 3.5 set the TUNING control at 3.5 and set the signal generator at 3300 kcs. Adjust trimmer capacitor C-130 for maximum reading on the electronic voltmeter.

Set the TUNING control at 1.8 and the signal generator at 1600 kcs. Adjust the tuning core of L-107 for maximum reading on the electronic voltmeter.

Step 9. To align the oscillator on the 1 to 1.8 mc. range, set the FREQ. RANGE switch at 1 - 1.8, set the TUNING control at 1.8 and set the signal generator at 1600 kcs. Adjust C-131 for maximum reading on the electronic voltmeter.

Set the TUNING control at 1.0 mc. and the signal generator at 800 kcs. Adjust the tuning core of L-108 for maximum reading on the electronic voltmeter.

(*b*) BUFFER ALIGNMENT.

Step 1. Set the PLATE switch at OFF.

Step 2. Move the voltmeter connection from pin 5 of the mixer tube to pin 3 of the R.F. power amplifier tube V-112. Move the signal generator from pin 4 of V-110 to pin 4 of V-111, the buffer amplifier.

Step 3. Set the PLATE switch at ON. Set the FREQ. RANGE switch at 3.5 - 6.7.

Step 4. Set the TUNING control and signal generator at 6.7 mcs. Adjust the trimmer capacitor C-146 for maximum reading on the electronic voltmeter.

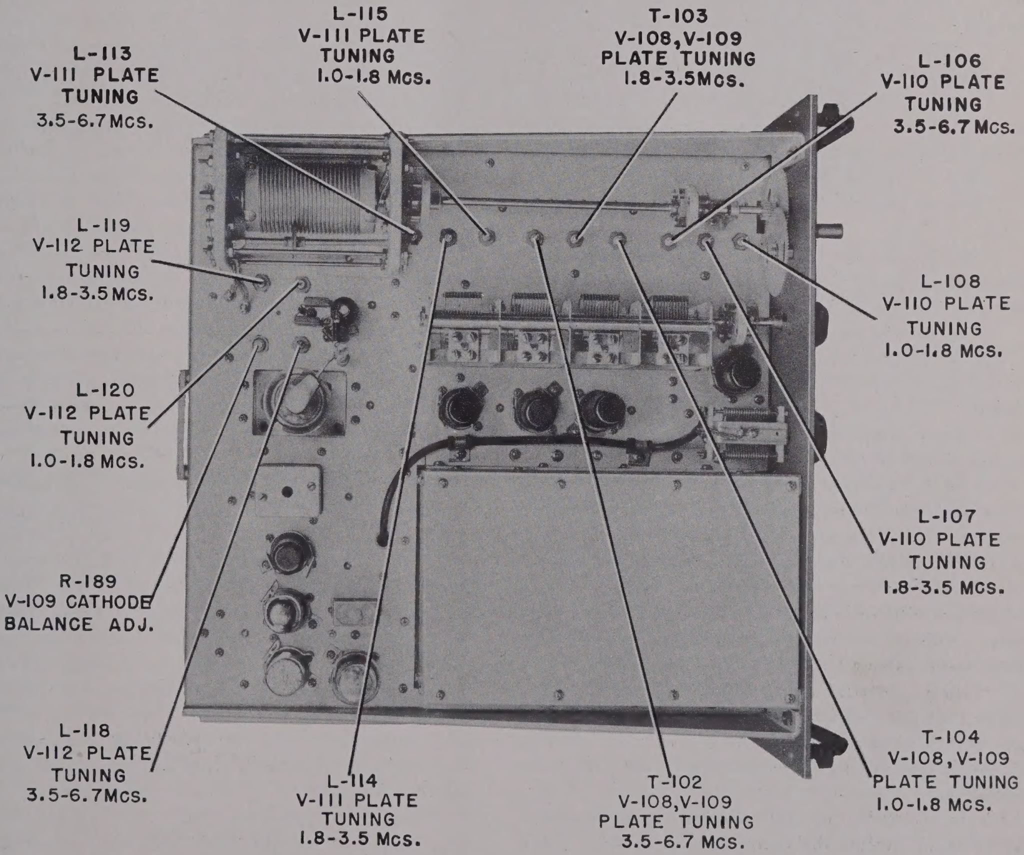

L-113 V-111 PLATE TUNING 3.5-6.7 MCS.
L-115 V-111 PLATE TUNING 1.0-1.8 MCS.
T-103 V-108, V-109 PLATE TUNING 1.8-3.5 MCS.
L-106 V-110 PLATE TUNING 3.5-6.7 MCS.
L-119 V-112 PLATE TUNING 1.8-3.5 MCS.
L-108 V-110 PLATE TUNING 1.0-1.8 MCS.
L-120 V-112 PLATE TUNING 1.0-1.8 MCS.
L-107 V-110 PLATE TUNING 1.8-3.5 MCS.
R-189 V-109 CATHODE BALANCE ADJ.
L-118 V-112 PLATE TUNING 3.5-6.7 MCS.
L-114 V-111 PLATE TUNING 1.8-3.5 MCS.
T-102 V-108, V-109 PLATE TUNING 3.5-6.7 MCS.
T-104 V-108, V-109 PLATE TUNING 1.0-1.8 MCS.

Figure 7–9. Alignment Adjustment Locations, Top View of Amplifier-Oscillator AM-655/URT

Step 5. Set the TUNING control and signal generator at 3.5 mcs. Adjust the tuning core adjustment of inductor L-113 for maximum reading on the electronic voltmeter.

The above procedure completes the buffer alignment for the 3.5 to 6.7 mc. range.

Step 6. To align the buffer amplifier on the 1.8 to 3.5 mc. range, set the FREQ. RANGE switch at 1.8 - 3.5, set the TUNING control and signal generator at 3.5 mcs. Adjust C-147 for a maximum reading on the electronic voltmeter.

Set the TUNING control and signal generator at 1.8 mcs. Adjust the tuning core of inductor L-114 for maximum reading on the electronic voltmeter.

Step 7. To align the buffer amplifier on the 1 to 1.8 mc. range set the FREQ. RANGE switch at 1-1.8, set the TUNING control and signal generator at 1.8 mcs. Adjust C-148 for a maximum reading on the electronic voltmeter.

Set the TUNING control and signal generator at 1.0 mcs. Adjust the tuning core of inductor L-115 for maximum reading on the electronic voltmeter.

(c) MIXER ALIGNMENT.

Step 1. Set the PLATE switch at OFF.

Step 2. Move the signal generator lead from pin 4 of V-111 to pin 8 of one of the two balanced mixer tubes V-108 or V-109.

Step 3. Set the PLATE switch ON.

Step 4. Set the FREQ. RANGE switch at 3.5 - 6.7.

Step 5. Set the TUNING control and signal generator at 6.7 mcs. Adjust trimmer capacitor C-140 for maximum reading on the electronic voltmeter.

Step 6. Set the TUNING control and signal generator at 3.5 mcs. Adjust the tuning core of inductor T-102 for maximum reading on the electronic voltmeter.

The above procedure completes the mixer alignment for the 3.5 to 6.7 mc. range.

Step 7. To align the mixer on the 1.8 to 3.5 mc. range, set the FREQ. RANGE switch at 1.8 - 3.5, set the TUNING control and signal generator at 3.5 mcs. Adjust C-141 for maximum reading on the electronic voltmeter.

Set the TUNING control and signal generator at 1.8 mcs. Adjust the tuning core of inductor T-103 for maximum reading on the electronic voltmeter.

Step 8. To align the mixer on the 1.0 to 1.8 mcs. range, set the FREQ. RANGE switch at 1 - 1.8, set the TUNING control and signal generator at 1.8 mcs. Adjust C-142 for maximum reading on the electronic voltmeter.

Set the TUNING control and the signal generator at 1.0 mcs. Adjust the tuning core of inductor T-104 for maximum reading on the electronic voltmeter.

(d) R.F. POWER AMPLIFIER ALIGNMENT.

Step 1. Set the PLATE switch at OFF.

Step 2. Remove the electronic voltmeter, set the PLATE switch at ON and the METERING switch at PLATE.

Step 3. Set the FREQ. RANGE switch at 3.5 - 6.7.

Step 4. Set the TUNING control and the signal generator at 6.7 mcs.

Step 5. Unlock the OUTPUT TUNING and OUTPUT LEVEL controls. Adjust the OUTPUT LEVEL control for minimum coupling as indicated by a minimum reading on the calibrated dial.

Step 6. Set the TUNING control and the signal generator at 3.5 mcs. Adjust the OUTPUT LEVEL control for minimum coupling. Adjust the OUTPUT TUNING control for minimum plate current (approximately 30 ma.) as indicated on the panel meter. If a resonant dip is not obtained adjust the tuning core of inductor L-118 for minimum plate current as indicated on the panel meter.

Step 7. Set the FREQ. RANGE switch at 1.8 - 3.5. Set the TUNING control and the signal generator at 1.8 mcs. Adjust the OUTPUT LEVEL control for minimum coupling. Adjust the OUTPUT TUNING control for minimum plate current (approximately 30 ma. -- actual meter reading of 1.5 ma.) as indicated on the panel meter. If a resonant dip is not obtained adjust the tuning core of inductor L-119 for minimum plate current as indicated on the panel meter.

Step 8. Set the FREQ. RANGE switch at 1 - 1.8, Set the TUNING control and the signal generator at 1.0 mcs. Adjust the OUTPUT LEVEL control for minimum coupling. Adjust the OUTPUT TUNING control for minimum plate current (approximately 30 ma.) as indicated on the panel meter. If a resonant dip is not obtained adjust the tuning core of inductor L-121 for minimum plate current as indicated on the panel meter.

Step 9. Set the FREQ. RANGE switch at 3.5 - 6.7. Set the TUNING control and the signal generator at 6.7 mcs.

Step 10. Load the OUTPUT LEVEL control until a useable reading is obtained on the R.F. ammeter and simultaneously resonate the OUTPUT TUNING control as indicated by minimum plate current reading on the panel meter. Increase the loading and tuning until the R.F. ammeter reads 285 ma. and the panel meter reads 85 ma.

Step 11. Set the FREQ. RANGE switch at 1.8 - 3.5. Set the TUNING control and the signal generator at 3.5 mcs.

Step 12. Repeat step 10.

Step 13. Set the FREQ. RANGE switch at 1 - 1.8. Set the TUNING control and the signal genera-

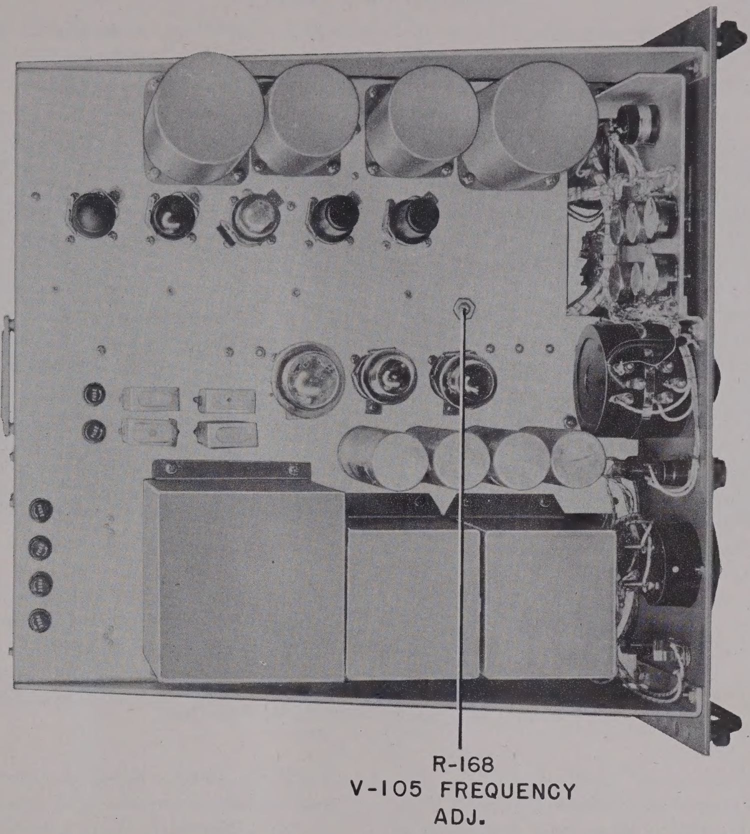


Figure 7–10. Alignment Adjustment Locations, Top View of Modulator-Power Supply MD-165/URT

tor at 1.8 mcs.

Step 14. Repeat step 10.

Step 15. Lock the OUTPUT TUNING, OUTPUT LEVEL and TUNING controls.

Step 16. Remove the R.F. ammeter.

(4) MODULATOR ALIGNMENT.—The locations of the variable potentiometers referred to herein are shown on Figures 7–10 and 7–11.

(a) MARK AND SPACE ADJUSTMENTS.

Step 1. Set the Multiplier switch at X1 and the METERING switch at Input. Set the INPUT FILTER switch at Photo. Set the PHASE MODULATION control at OFF.

Step 2. Set the TEST-OPERATE switch at SPACE. Read and record the reading on the panel meter. A normal reading is approximately 1.9 volts.

Step 3. Set the TEST-OPERATE switch at MARK. Adjust the FSK MARK variable potentiometer R-114 for a reading exactly 2.5 volts higher than the reading obtained at SPACE in Step 2.

Step 4. Set the TEST-OPERATE switch at CARRIER. Adjust the FSK CAR. potentiometer R-117 for a reading approximately 1.25 volts higher than the reading obtained at SPACE in Step 2.

The above center frequency adjustment is not critical. However, the change of 2.5 volts SPACE to MARK as performed in Steps 2 and 3 should be made with the greatest accuracy.

(b) DEVIATION CALIBRATION.—After the above adjustments have been completed adjust the DEV. CALIB. potentiometer R-106 to calibrate the range of the front panel DEVIATION control. This adjustment is accomplished utilizing an external battery source of five volts or more. The battery must be capable of maintaining five volts on 600 ohms.

Step 1. Connect the battery to the keyer input jack J-101. Connect the positive lead to pin A and the negative lead to pin B.

Step 2. Set the TEST-OPERATE switch at

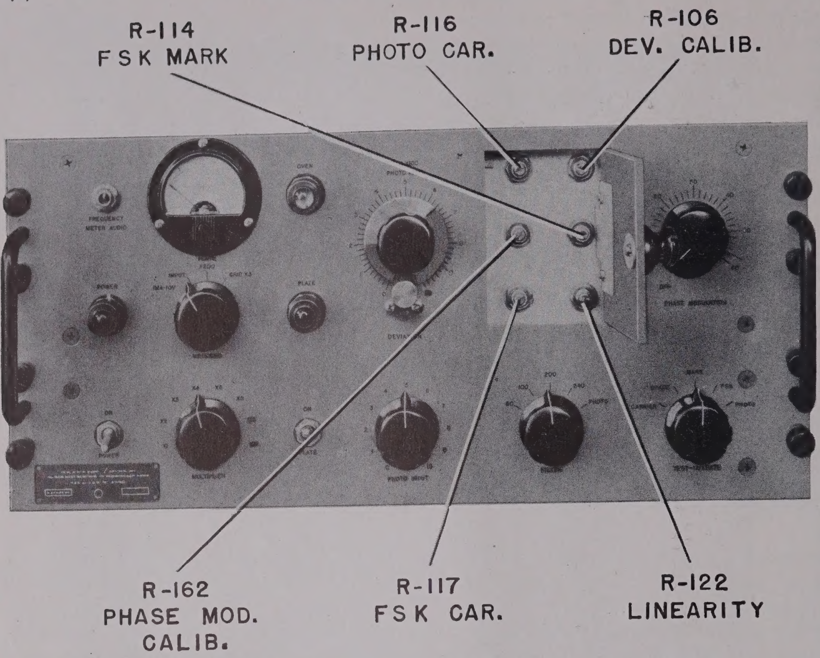


Figure 7–11. Alignment Adjustment Locations, Front View of Modulator-Power Supply MD-165/URT with Panel Door Open

PHOTO and the METERING switch at INPUT. Set the DEVIATION control at maximum deviation. Adjust the PHOTO INPUT control for a reading of 5 volts on the front panel meter.

Step 3. Connect cable W-107 between the keyer Frequency Meter R.F. output jack J-110 and the input of a frequency meter such as NAVY MODEL LM or equivalent. Note the reading on the frequency meter.

Step 4. Remove the battery and note the reading on the Frequency Meter. The difference between this reading and the one obtained in Step 3 should be exactly 2000 cycles. If this is not true, adjust the DEV. CALIB. potentiometer for the correct difference frequency. Check by reconnecting the battery.

If a battery source is not available, the above adjustment of the DEV. CALIB. control can be made on frequency shift. There is some reaction between controls and repetition of steps will be required to obtain the necessary accuracy. Proceed as follows:

Adjust the DEV. CALIB. potentiometer so that changing the TEST-OPERATE switch from SPACE to MARK causes a 2.5 volt change on the panel meter and exactly 1000-cycle change in the R.F. output. It should be noted that movement of the DEV. CALIB. control causes a change in the frequency of both SPACE and MARK. Repeated adjustments will be required to obtain accurate measurements.

(*c*) LINEARITY ADJUSTMENT.–After the deviation adjustments are completed, the remaining adjustments can be made as follows:

Step 1. Set the DEVIATION control at zero and note the R.F. output frequency as read on the frequency meter. This is the true carrier frequency and is the assigned frequency of the keyer. This frequency can only be varied by changing the frequency determining crystal or external oscillator. The panel CARRIER CALIBRATE control provides a means of adjusting the frequency over a narrow range.

Step 2. With the TEST-OPERATE switch at CARRIER, set the DEVIATION control at maximum. Adjust the LINEARITY potentiometer R-122 for the same R.F. output frequency as obtained with the DEVIATION control at zero in Step 1. After this adjustment is completed, movement of the DEVIATION control will not change the carrier when the TEST-OPERATE switch is set at CARRIER.

Step 3. Set the DEVIATION control at maximum. Set the TEST-OPERATE switch at SPACE. Adjust the FSK CAR. potentiometer until SPACE is 500 cycles lower than the carrier as measured in Step 2.

Step 4. Set the DEVIATION control at maximum and the TEST-OPERATE switch at Photo. Adjust the PHOTO CAR. potentiometer until the frequency is 1000 cycles lower than the carrier. If a battery is available the accuracy of the adjustment can be ascertained by applying 5 volts to the photo input circuit. The frequency should then be 1000 cycles higher than the assigned carrier frequency.

(d) PHASE MODULATOR FREQUENCY CONTROL.

Step 1. Connect the vertical plates of an oscilloscope between pin 1 of V-106 and chassis.

Step 2. Connect the horizontal plates of the oscilloscope to a variable audio oscillator. Adjust the oscillator to 200 cycles.

Step 3. Adjust the phase modulator frequency control R-168 until the phase modulation oscillator circuit is tuned to exactly 200 cycles. The 200-cycle voltage will appear as a circular 1:1 frequency ratio pattern on the oscilloscope screen. The range of R-168 is approximately 40 cycles.

Step 4. Remove the oscilloscope and variable audio oscillator.

(e) PHASE MODULATION ADJUSTMENT.

Step 1. Connect a low-reading high impedance voltmeter such as a Ballantine model 300 between pin 1 of V-106 and chassis.

Step 2. Set the PHASE MODULATION control at one radian.

Step 3. Adjust the PHASE MOD. CALIB. potentiometer R-162 for a reading of 0.0875 volts RMS on the voltmeter. The PHASE MODULATION control is now calibrated for the correct voltage to produce one radian at 57.3 degrees on the dial scale.

Step 4. Remove the voltmeter.

(f) CARRIER BALANCE ADJUSTMENT.—This adjustment is more accurately made at frequencies above 4 megacycles.

Step 1: Set the METERING switch at PLATE.

Step 2. Remove the 200-Kc. oscillator tube V-107 so that only one point of drive can be found.

Step 3. Set the TUNING control at the point of maximum drive. Adjust the CATHODE BALANCE potentiometer R-189 for the least amount of grid drive as indicated on the panel meter.

Step 4. Replace the 200-Kc. oscillator tube.

(g) CARRIER CALIBRATE ADJUSTMENT.

Step 1. After the crystal oven has reached its operating temperature of 70° set the plate switch at ON. Set the CARRIER CALIBRATE control at 50. Set the TEST-OPERATE switch at CARRIER. Set the CRYSTAL-OSC. switch and the FREQ. RANGE switch at corresponding positions. Set the TUNING control at the keyer output frequency.

Step 2. Open the oven door and adjust the tuning core of L-103 until the frequency as observed on the frequency meter is 200 kcs. above the crystal fre-

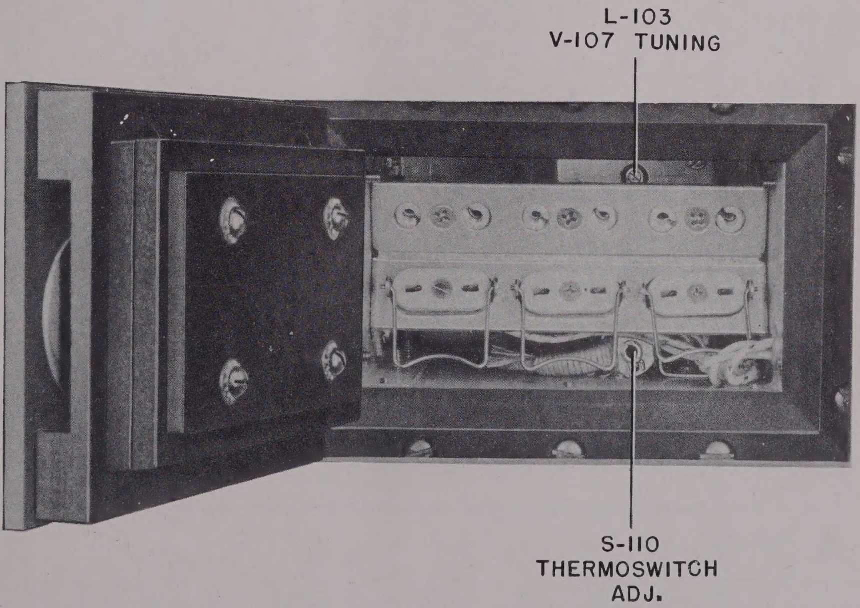


Figure 7–12. Alignment Adjustment Locations, Front View of Amplifier Oscillator AM-655/URT with Panel Door Open

quency. Close the oven door.

Step 3. Set the METERING switch at GRID. Adjust the tuning core of L-104 for maximum reading on the panel meter. Readjust the final tuning as explained in Step 10 of paragraph 5 a. (1) (d). of this section.

Step 4. Remove all test equipment.

(b) OVEN THERMOSTAT ADJUSTMENT.

Step 1. Open the oven door. Turn the screwdriver adjustment on the thermostat S-110 in a counterclockwise direction to increase the temperature at which the thermoswitch opens. See Figure 7-12.

Step 2. To lower the thermoswitch threshold turn the screwdriver adjustment in a clockwise direction. Close the oven door.

b. MECHANICAL ADJUSTMENTS.—Tools required for the mechanical adjustments described herein consist of:

1. No. 8 Allen Wrench (mounted at the rear of the crystal oven).
2. Medium size Phillips screwdriver, Federal Standard Stock Catalogue No. 3-41-S-1640 or No. 4-41-S-1642.
3. Medium size screwdriver, Federal Standard Stock Catalogue No. 41-S-1104.
4. Long-nose pliers.
5. Soldering iron and accessories.

(1) CONTROL KNOBS AND COUPLINGS.—All control knobs are fastened to their respective shafts by 8-32 Allen set-screws. To remove the knobs, insert a No. 8 Allen wrench into the ends of the screws, rotate a few turns counterclockwise until the knob turns freely on the shaft. It can then be lifted off the shaft. All shaft couplings are secured by means of 8-32 Allen set-screws.

(2) DISASSEMBLY.—Refer to paragraph 5 a (1) and 5 a (2) for disassembly instructions.

(3) REMOVAL OF AM-655/URT BOTTOM.—Loosen the 23 captivated type screws around the outer edges of the bottom and lift the bottom off.

(4) REMOVAL OF MD-165/URT BOTTOM.—Loosen the 16 captivated screws around the outer edges of the bottom and lift the bottom off.

(5) REMOVAL OF CRYSTAL OVEN.

Step 1. Loosen the three 4-40 screws that secure the thermometer to the front panel. Remove the thermometer.

Step 2. Unsolder the nine bus leads between terminal boards TB-101 and TB-102.

Step 3. Loosen and remove the two 6-32 screws securing the oven to the bottom of the chassis.

Step 4. Loosen and remove the four 8-32 screws on each side of the crystal oven.

Step 5. Lift the oven up and away from the chassis.

TABLE 7–1. TUBE OPERATING VOLTAGES AND CURRENTS

TUBE TYPE	FUNCTION	PLATE (E)	PLATE (MA)	SCREEN (E)	SCREEN (MA)	SUPP (E)	CATH (E)	GRID (E)	HEATER A.C. (E)
1/2 6H6	Limiter	0	0	—	—	—	19	—	6.3
1/2 6H6	Limiter	19	.15	—	—	—	19	—	6.3
1/2 6H6	Limiter	0	0	—	—	—	12.4	—	6.3
1/2 6H6	Limiter	12.4	.03	—	—	—	12.7	—	6.3
1/2 6SN7W	Cathode Follower	150	7	—	—	—	15	12	6.3
1/2 6SN7W	Cathode Follower	150	4.8	—	—	—	10	5	6.3
6J5	Cathode Follower	270	9	—	—	—	9	—	6.3
6SJ7W	Phase Modulation Osc.	215	2.5	90	1.0	3.3	3.3	0	6.3
1/2 6SN7W	Reactance Modulator	150	1.5	—	—	—	7.8	.3	6.3
1/2 6SN7W	Reactance Modulator	150	1.5	—	—	—	7.8	.4	6.3
6SJ7W	200 Kc. Osc.	85	2.7	62	.082	0	0	1.6	6.3
6SJ7W	Crystal Osc.	88	2.0	80	.68	0	.1	-3	6.3
6SA7	Balanced Mixer	205	1.2	100	5.5	0	3.7	-5	6.3
6SA7	Balanced Mixer	205	1.2	100	5.5	0	3.7	-5	6.3
6AC7W	Buffer Amp.	270	10	62	2.25	0	0	0	6.3
807	R.F. Power Amp.	270	74	170	10	—	3	-7.5	6.3
VR150	Voltage Regulator	150	—	—	—	—	—	—	—
5U4	Rectifier	360 A.C.	200	—	—	—	340	—	5.0
VR150	Voltage Regulator	150	—	—	—	—	—	—	—
VR75	Voltage Regulator	75	—	—	—	—	—	—	—

Measured with voltohmyst.
All readings made with Test-Operate switch set at Mark.
Deviation control at zero and Phase Modulation control set at one radian.

TABLE 7–2. RATED TUBE CHARACTERISTICS

TUBE TYPE	FILAMENT VOLTAGE (V)	FILAMENT CURRENT (A)	PLATE VOLTAGE (V)	GRID BIAS (V)	SCREEN VOLTAGE (V)	PLATE CURRENT (MA)	SCREEN CURRENT (MA)	A.C. PLATE RESISTANCE (OHMS)	VOLTAGE AMPLIFICATION FACTOR (MU)	TRANSCONDUCTANCE (MICROMHOS)		EMISSION	
										NORMAL	MINIMUM	IS (MA)	TEST VOL T.
6H6	6.3	0.3	150 A.C.*	—	—	8*	—	—	—	—	—	15**	20
6SN7W	6.3	0.6	250	-8	—	9		7700	20	3000	2400	40*	30
6J5	6.3	0.3	250	-8	—	9	—	7700	20	2600	2075	40	30
6AC7W	6.3	0.45	300	160#	150	10	2.5	1,000,000	6750	9000	7000	40	10
6SJ7W	6.3	0.3	250	-3	100	3	0.8	1,500,000	2500	1650	1325	60	30
6SA7	6.3	0.3	250	0###	100	8	3.4	800,000	—	4700*** 13##	3500*** 0.5##	70	30
807	6.3	0.9	400	-45	250	100	7.5	4,000	—	—	—	300	50
5U4	5	3	450*	—	—	225	—	—	—	—	—	225*	75
OD3/ VR150	—	—	150	—	—	5–40	—	—	—	—	—	—	—
OA3/ VR75	—	—	75	—	—	5–40	—	—	—	—	—	—	—

*Per plate
**Per diode
#Cathode resistor - ohms
###Grid bias - 2 volts if separate oscillator excitation is used
***Oscillator transconductance
##Conversion transconductance

TABLE 7–3. WINDING DATA CHART

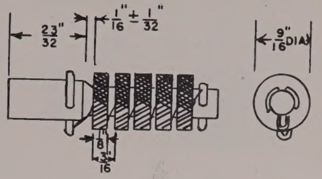
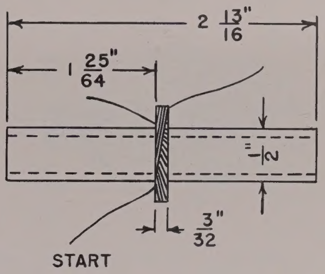
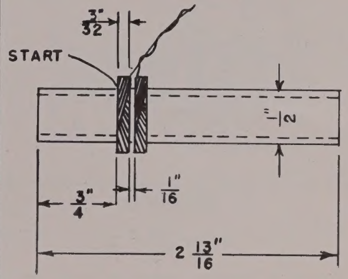
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-101 L-102	SA:4884		5 pie univer-sal wnd	#38 ESN	370 per pie, total 1850	1.5			10 mh, brush on bakelite resin varnish
L-103	SA:8886		univer-sal wnd	#10/41 ESN	20 to tap, total 99	0.52 to tap, total 2.84			10 microhenries to tap, total 205 microhenries, tapped at 20 turns, apply Q-max lacquer
L-104	SA:8885		2 pie univer-sal wnd	#10/41 ESN	90 C.T.	1.12 to tap, total 2.36			42 microhenries to tap, total 117 microhenries, center tapped, apply Q-max lacquer

TABLE 7–3. WINDING DATA CHART (Cont'd)

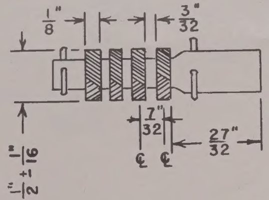
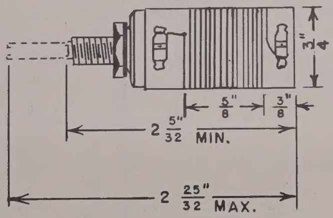
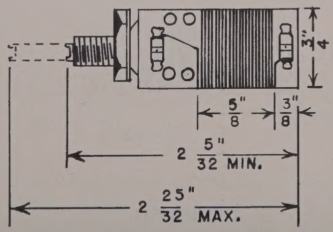
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-105	SA:35A		4 pie universal wnd	#36 ESN	230 per pie, total 920	11 per pie, total 44			0.44 mh per pie, total 2.5 mh, brush on bakelite resin varnish
L-106	SA:8864		single	#26 E	17	0.148			5.45 microhenries w-slug, apply Q-max lacquer
L-107	SA:8865		single	#26 E	36	0.316			23.7 microhenries w/slug, apply Q-max lacquer

TABLE 7–3. WINDING DATA CHART (Cont'd)

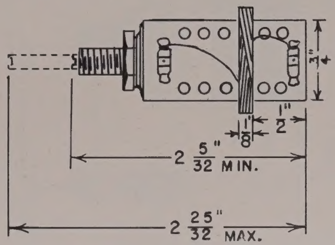
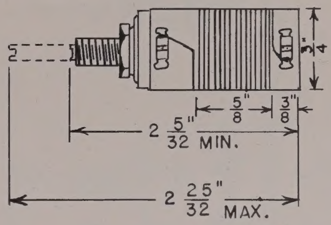
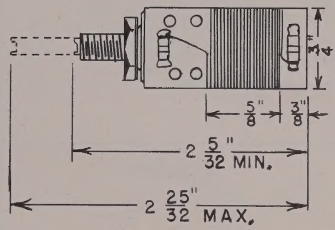
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-108	SA:8866		1 winding universal wnd	#10/41 ESN	52	1.825			102 microhenries w/slug, apply Q-max lacquer
L-113	SA:8870		single	#26 E	15	0.130			4.5 microhenries w/slug, apply Q-max lacquer
L-114	SA:8871		single	#26 E	28	0.256			17.1 microhenries w/slug, apply Q-max lacquer

TABLE 7–3. WINDING DATA CHART (Cont'd)

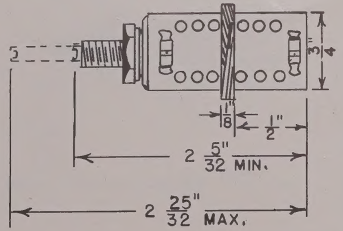
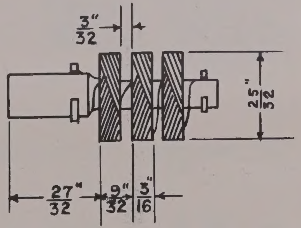
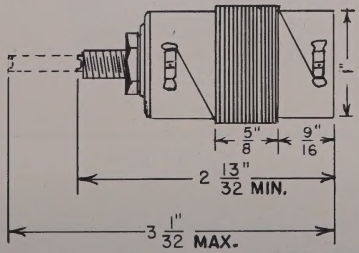
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-115	SA:8872	 $\frac{3}{4}$" $\frac{1}{8}$" $\frac{1}{2}$" 2 $\frac{5}{32}$" MIN. 2 $\frac{25}{32}$" MAX.	1 winding universal wnd	#10/41 ESN	41	1.345			67 microhenries w/slug, apply Q-max lacquer
L-116	SA:4014	 $\frac{3}{32}$" $\frac{25}{32}$" $\frac{27}{32}$" $\frac{9}{32}$" $\frac{3}{16}$"	1 winding 3 pie universal wnd	#32 ESN	1020	20.0			5 mh total brush on bakelite resin varnish
L-118	SA:8873	 1" $\frac{5}{8}$" $\frac{9}{16}$" 2 $\frac{13}{32}$" MIN. 3 $\frac{1}{32}$" MAX.	single	#20 E	17	0.052			7.8 microhenries w/slug, apply Q-max lacquer

TABLE 7-3. WINDING DATA CHART (Cont'd)

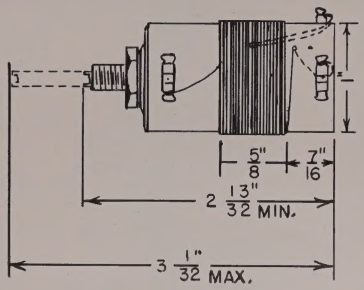
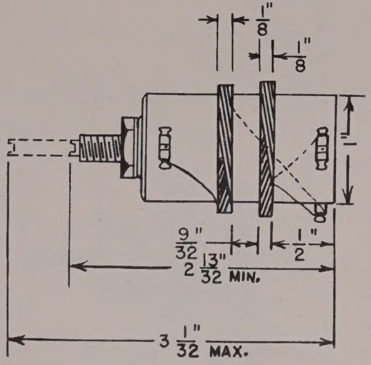
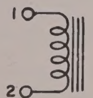
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-119	SA:8874		single	#26 E	34 C.T.	0.207 to C.T., total 0.414			32 microhenries w/slug, center tapped, apply Q-max lacquer
L-120	SA:8875	 1"/8 1"/8 1" 9"/32 1"/2 2 13"/32 MIN. 3 1"/32 MAX.	2 pie universal wnd	#26 ESN	24 first pie, 32 second pie, total 56	0.318 first pie, 0.420 second pie, total 0.738			108 microhenries w/slug, tapped at 24 turns, apply Q-max lacquer
L-122 L-123	H391		layer wnd	#27 PE (AWG)	2900	125		2000 v RMS	8 henries at 200 ma., in vacuum impregnated hermetically sealed can

TABLE 7–3 WINDING DATA CHART (Cont'd)

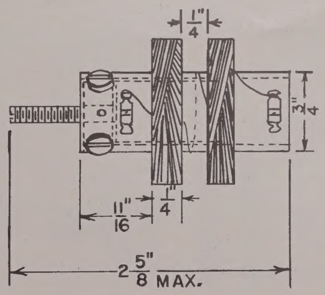
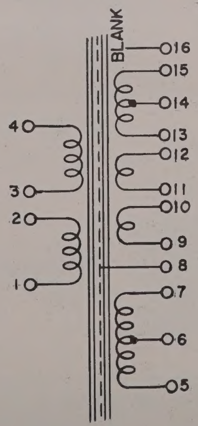
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
L-124 L-125	SA:8892		2 pie universal wnd	#20 E	75 per pie, total 150	0.5			0.6 mh w/slug; apply bakelite resin varnish
T-101	P632-1	 BLANK 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1	layer wnd					2000 v RMS	
			primary #1 and #2	#21 PE (AWG)	200	2.05			115 VAC
			#3 and #4	#21 PE (AWG)	200	2.25			115 VAC
			secondary #5, 6 and 7	#28 PE (AWG)	1300	106.7			720 VAC at 250 ma., center tap at terminal #6
			secondary #8						electrostatic shield
			secondary #9 and #10	#15 PE (AWG)	24	0.174			12.6 VAC at 3 amp.
			secondary #11 and #12	#18 PE (AWG)	10	0.074			5.25 VAC at 3 amp.

TABLE 7-3. WINDING DATA CHART (Cont'd).

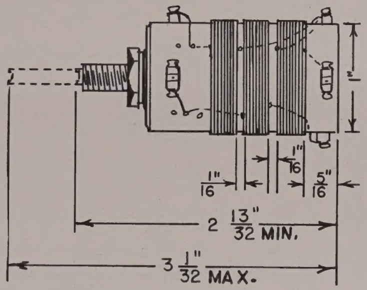
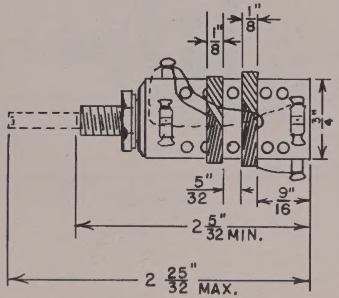
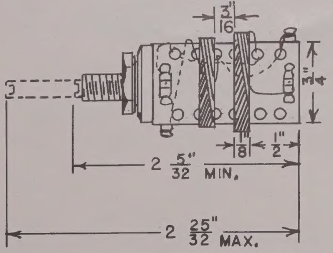
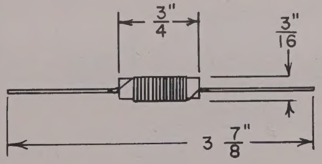
SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
T-101 cont'd.			secondary #13, #14 and #15	#18 PE (AWG)	12	0.022			6.6 VAC at 10 amp., center tap at terminal #14
			#16						blank terminal
T-102	SA:8867	 1" 1/16" 1/16" 5/16" 2 13/32" MIN. 3 1/32" MAX.	primary	#26 E	20	0.250			8.6 microhenries w/o slug
			secondary	#26 E	9	0.116			3.2 microhenries w/o slug
			single layer wnd						total 9.6 microhenries w/slug, apply Q-max lacquer
T-103	SA:8868	 1/8" 1/8" 3/4" 5/32" 9/16" 2 5/32" MIN. 2 25/32" MAX.	primary	#10/41 ESN	31	0.990			33.7 microhenries w/o slug
			secondary	#10/41 ESN	15	0.62			8.9 microhenries w/o slug, total 35.8 microhenries w/slug, apply Q-max lacquer
			universal wnd						apply Q-max lacquer

TABLE 7-3. WINDING DATA CHART (Cont'd)

SYMBOL DESIG.	NAT. PT. NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	D.C. RES. IN OHMS	IMPED-ANCE RATIO	HIPOT AC VOLTS	REMARKS
T-104	SA:8869	 3"/16 3"/4 1"/8 1"/2 2 5"/32 MIN. 2 25"/32 MAX.	primary	#10/41 ESN	59	1.94			112 microhenries w/o slug
			secondary	#10/41 ESN	15	0.63			8.3 microhenries w/o slug, total 121 microhenries w/slug, apply Q-max lacquer
			univer-sal wnd						
L-117	SA:6073		single	#24 E	25	0.039			1 microhenry, apply Q-max lacquer

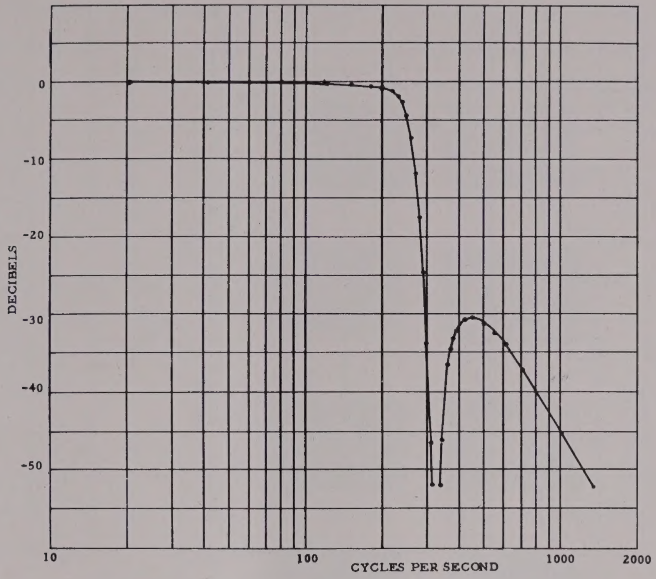


Figure 7–13. Frequency Response of 60-cycle Keying Filter Z-101

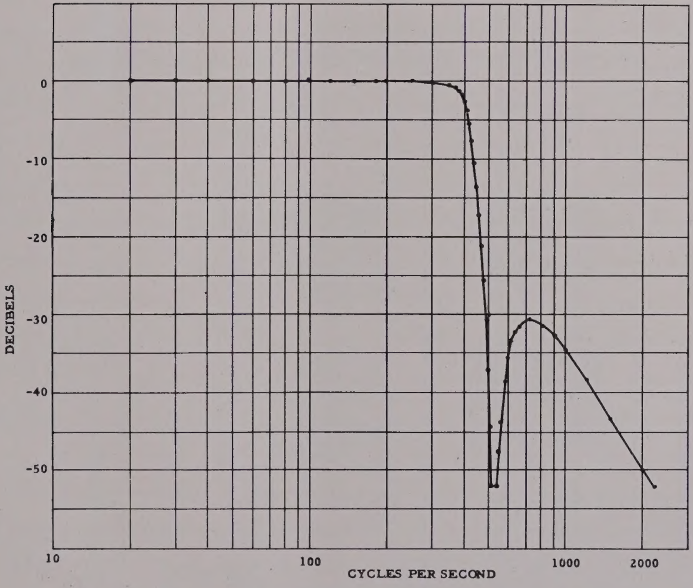


Figure 7–14. Frequency Response of 100-cycle Keying Filter Z-102

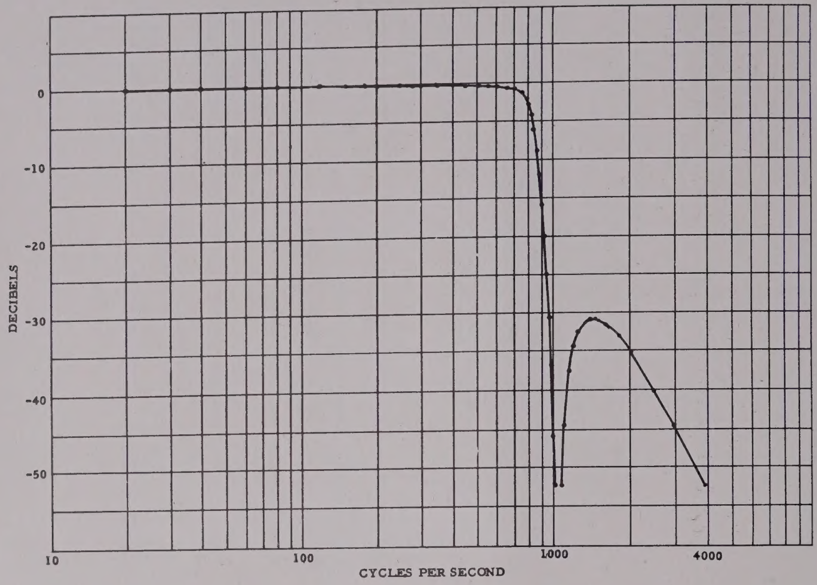


Figure 7–15. Frequency Response of 200-cycle Keying Filter Z-103

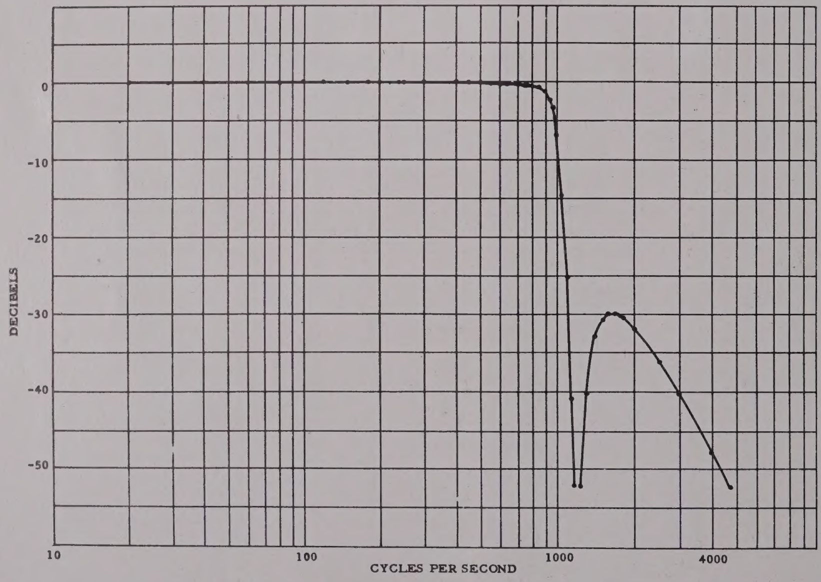


Figure 7–16. Frequency Response of 240-cycle Keying Filter Z-104

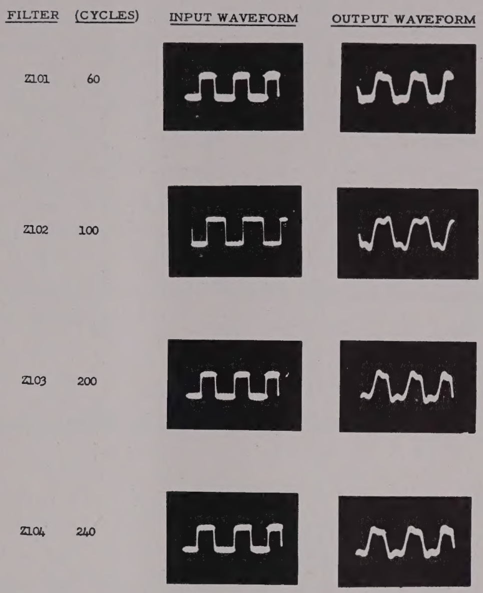


Figure 7–17. Transient Response of Waveshaping Filters

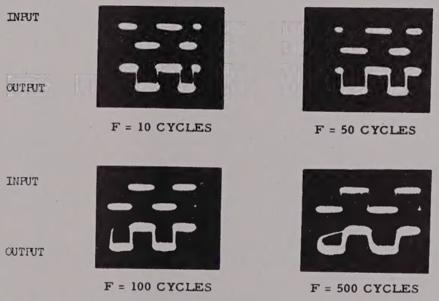


Figure 7–18. Overall Dynamic Response of Photo Circuits

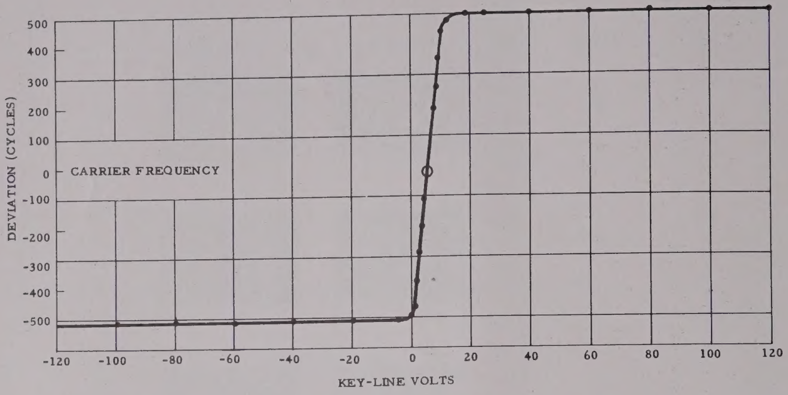


Figure 7–19. Frequency-Shift vs. Key Line Voltage, Static Test

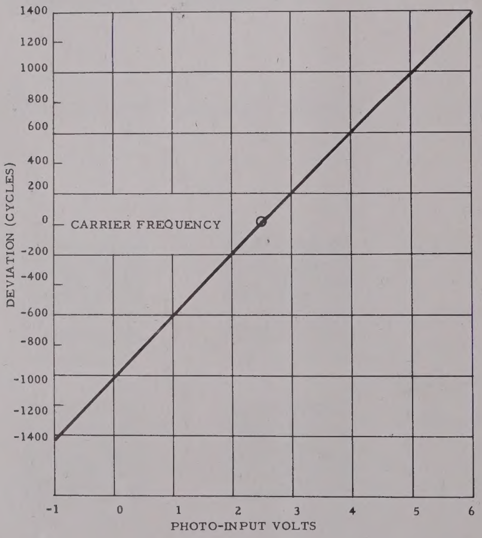
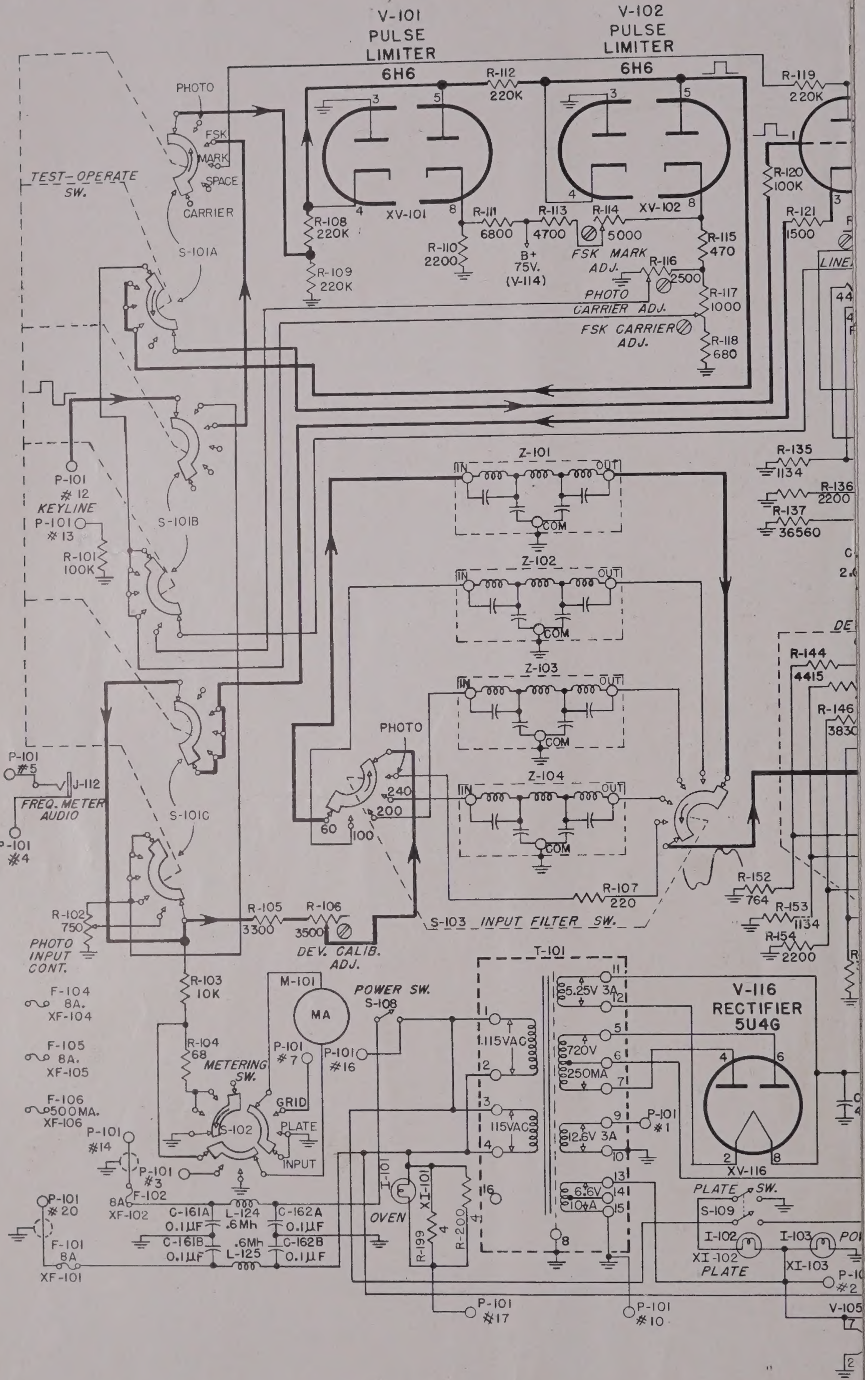
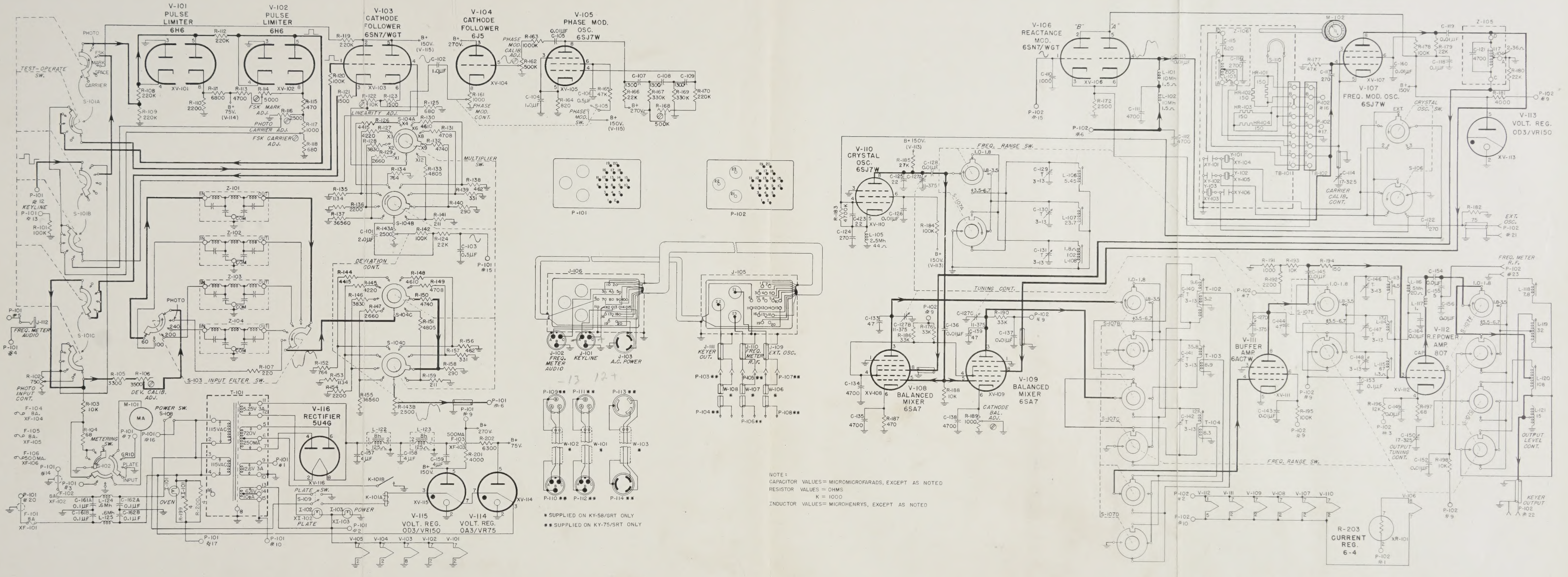


Figure 7–20. Overall Photo Linearity, Static Test


V-101
PULSE
LIMITER
6H6
V-102
PULSE
LIMITER
6H6
R-112
220K
R-119
220K
PHOTO
FSK
MARK
SPACE
CARRIER
TEST-OPERATE
SW.
S-101A
XV-101
XV-102
R-108
220K
R-109
220K
R-110
2200
R-111
6800
R-113
4700
R-114
5000
B+
75V.
(V-114)
FSK MARK
ADJ.
R-115
470
R-116
2500
PHOTO
CARRIER ADJ.
R-117
1000
FSK CARRIER
ADJ.
R-118
680
R-120
100K
R-121
1500
LINE
P-101
#12
KEYLINE
P-101
#13
R-101
100K
S-101B
Z-101
IN
OUT
COM
Z-102
Z-103
Z-104
R-135
1134
R-136
2200
R-137
36560
R-144
4415
R-146
3830
PHOTO
240
200
60
100
P-101
#5
J-112
FREQ. METER
AUDIO
P-101
#4
S-101C
R-102
750
PHOTO
INPUT
CONT.
R-105
3300
R-106
3500
DEV. CALIB.
ADJ.
R-107
220
S-103 INPUT FILTER SW.
R-152
764
R-153
1134
R-154
2200
R-103
10K
F-104
8A.
XF-104
F-105
8A.
XF-105
F-106
500MA.
XF-106
M-101
MA
POWER SW.
S-108
R-104
68
METERING
SW.
P-101
#7
P-101
#16
GRID
PLATE
INPUT
S-102
T-101
115VAC
115VAC
5.25V 3A
720V
250MA
12.6V 3A
6.6V
10½A
V-116
RECTIFIER
5U4G
XV-116
P-101
#1
P-101
#14
P-101
#3
F-102
8A
XF-102
P-101
#20
F-101
8A
XF-101
C-161A
0.1µF
L-124
.6Mh
C-162A
0.1µF
C-161B
0.1µF
.6Mh
L-125
C-162B
0.1µF
I-101
XI-101
OVEN
R-199
R-200
PLATE
SW.
S-109
I-102
I-103
XI-102
PLATE
XI-103
P-101
#2
V-105
P-101
#17
P-101
#10

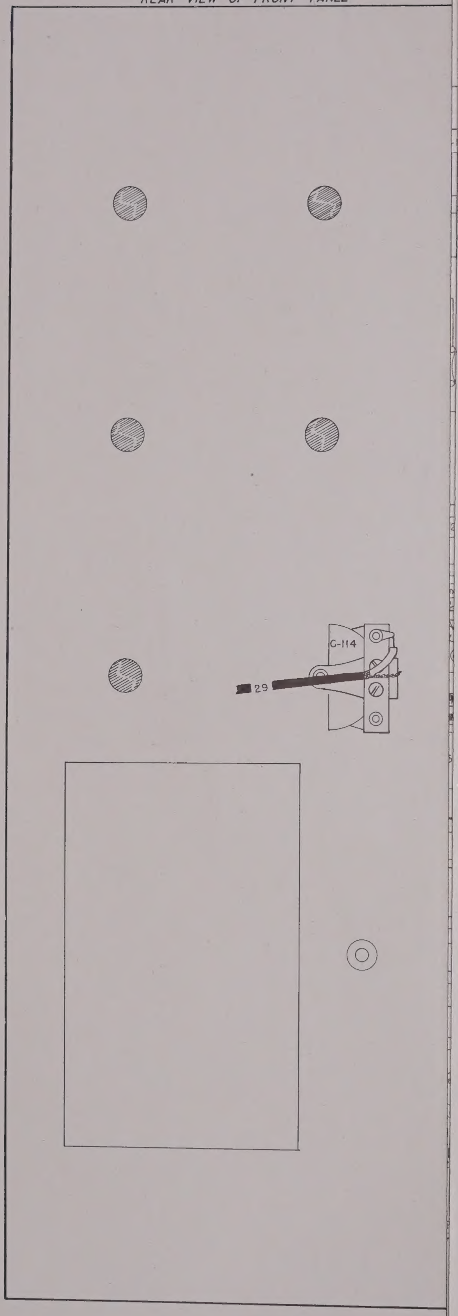


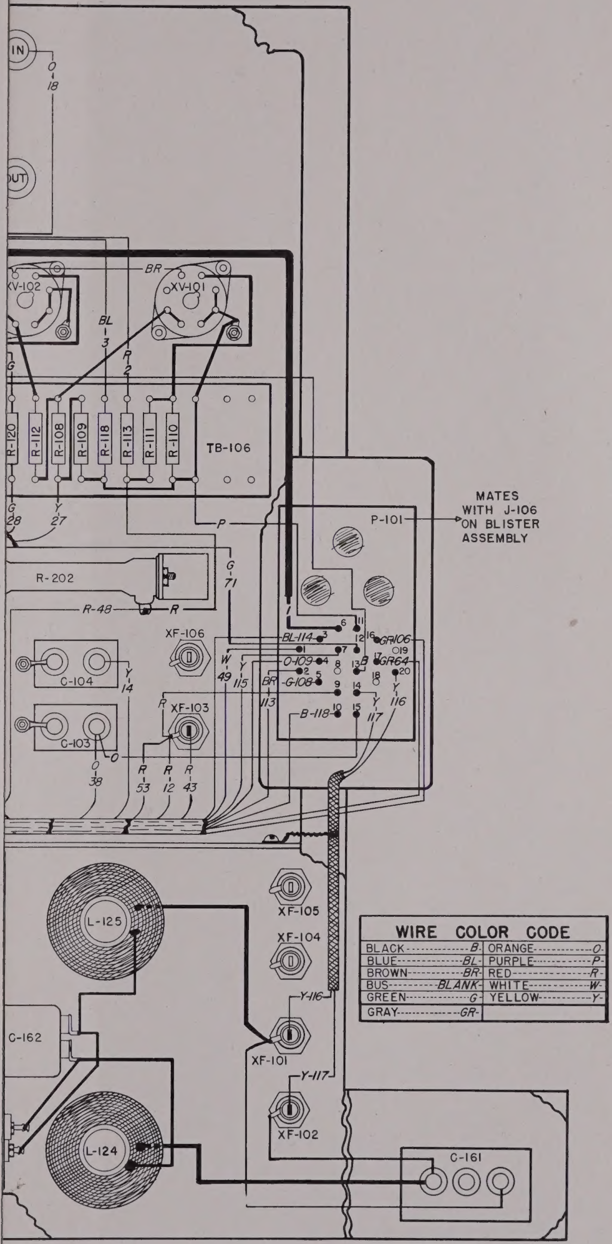
NOTE:
CAPACITOR VALUES = MICROMICROFARADS, EXCEPT AS NOTED
RESISTOR VALUES = OHMS
K = 1000
INDUCTOR VALUES = MICROHENRYS, EXCEPT AS NOTED

* SUPPLIED ON KY-58/GRT ONLY
** SUPPLIED ON KY-75/SRT ONLY

Figure 7-21. Schematic Diagram, KY-58/GRT and KY-75/SRT Keyers

REAR VIEW OF FRONT PANEL

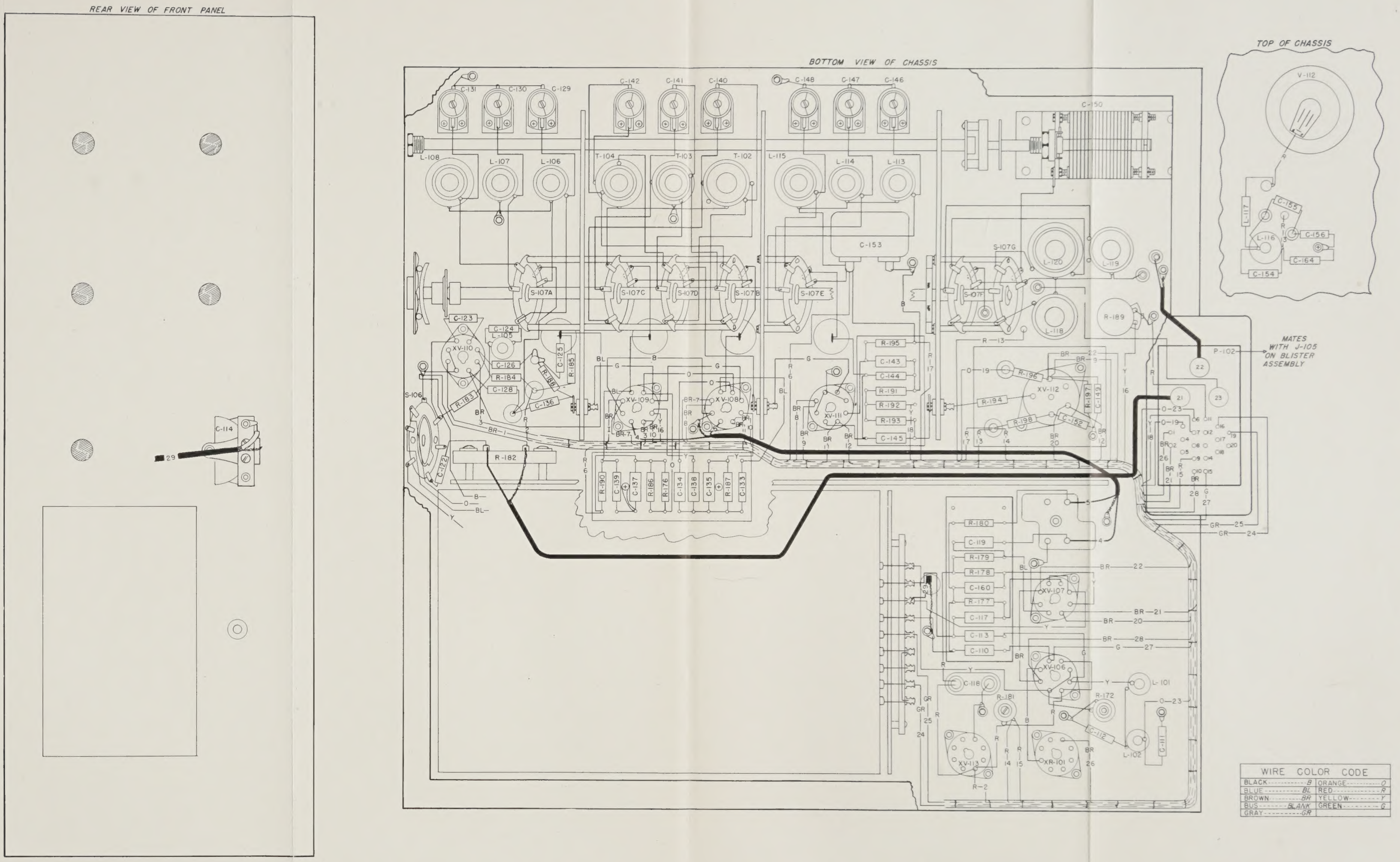




WIRE COLOR CODE

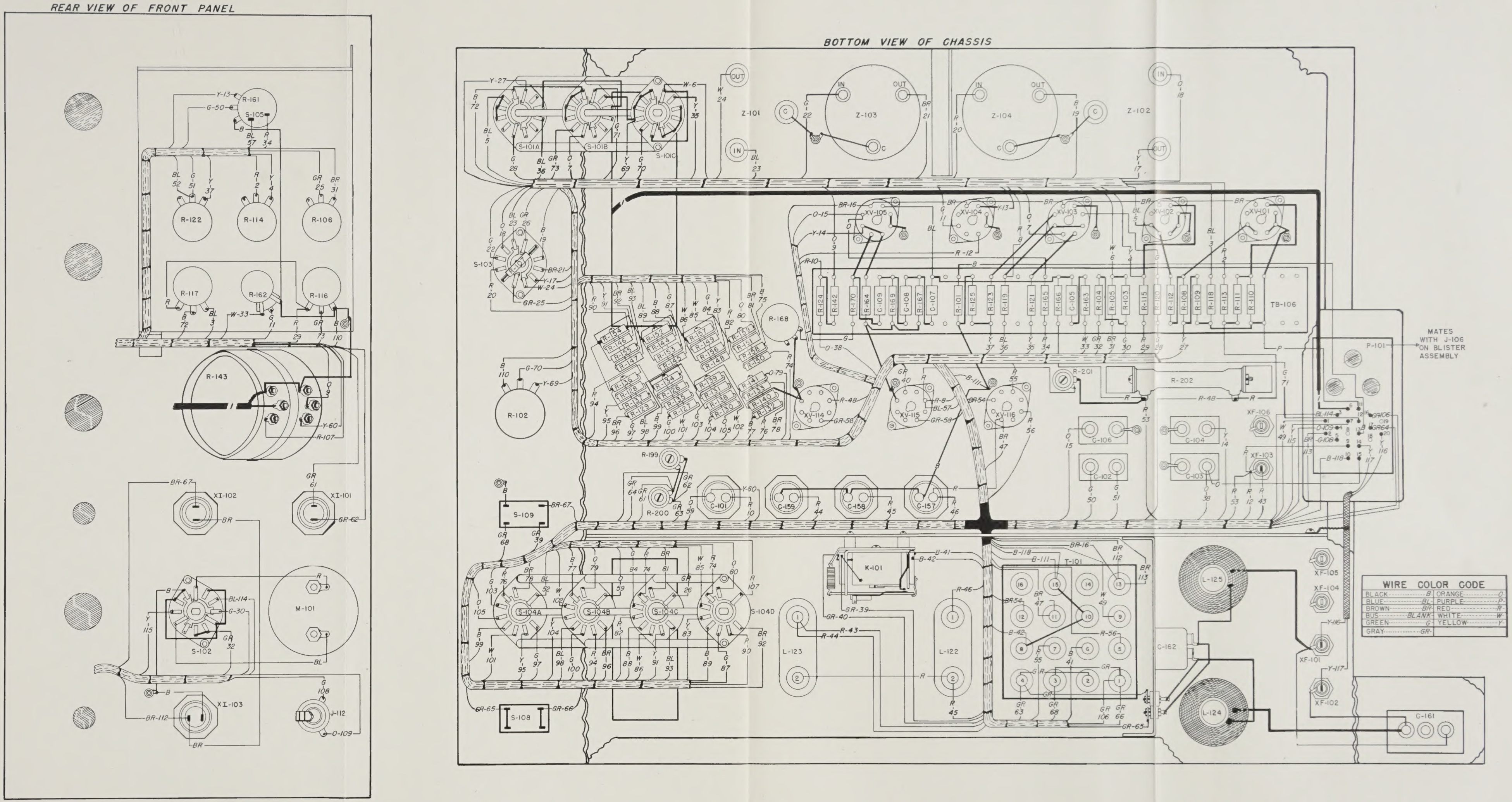
BLACK	B	ORANGE	O
BLUE	BL	PURPLE	P
BROWN	BR	RED	R
BUS	BLANK	WHITE	W
GREEN	G	YELLOW	Y
GRAY	GR		

iagram, Modulator-Power Supply MD-165/URT



WIRE COLOR CODE	
BLACK------------B	ORANGE------------O
BLUE ------------ BL	RED------------R
BROWN------------BR	YELLOW------------Y
BUS--------BLANK	GREEN------------G
GRAY------------GR	

Figure 7–22. Practical Wiring Diagram, Amplifier-Oscillator AM-655/URT



WIRE COLOR CODE	
BLACK ---------- B	ORANGE ---------- O
BLUE ---------- BL	PURPLE ---------- P
BROWN ---------- BR	RED ---------- R
BUS ---------- BLANK	WHITE ---------- W
GREEN ---------- G	YELLOW ---------- Y
GRAY ---------- GR	

Figure 7–23. Practical Wiring Diagram, Modulator-Power Supply MD-165/URT

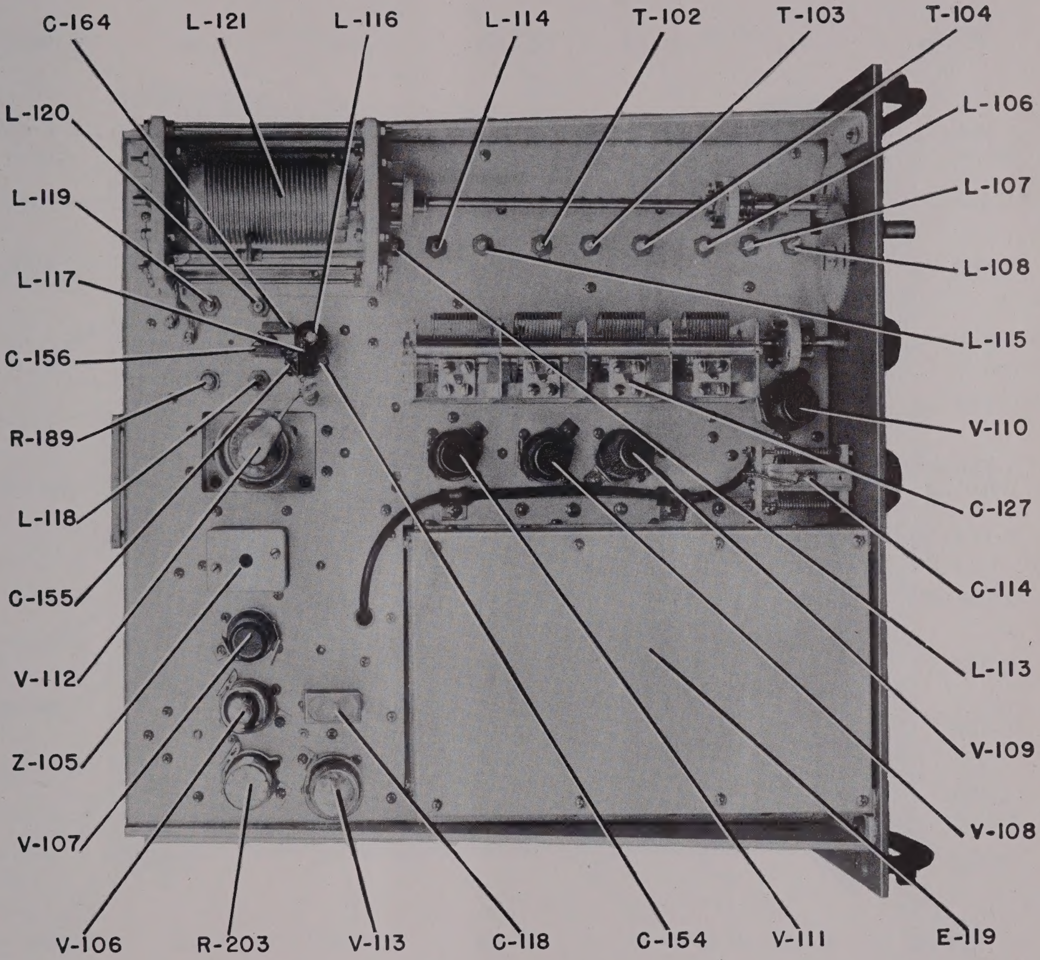


Figure 7–24. Component Locations, Top View of Amplifier-Oscillator AM-655/URT

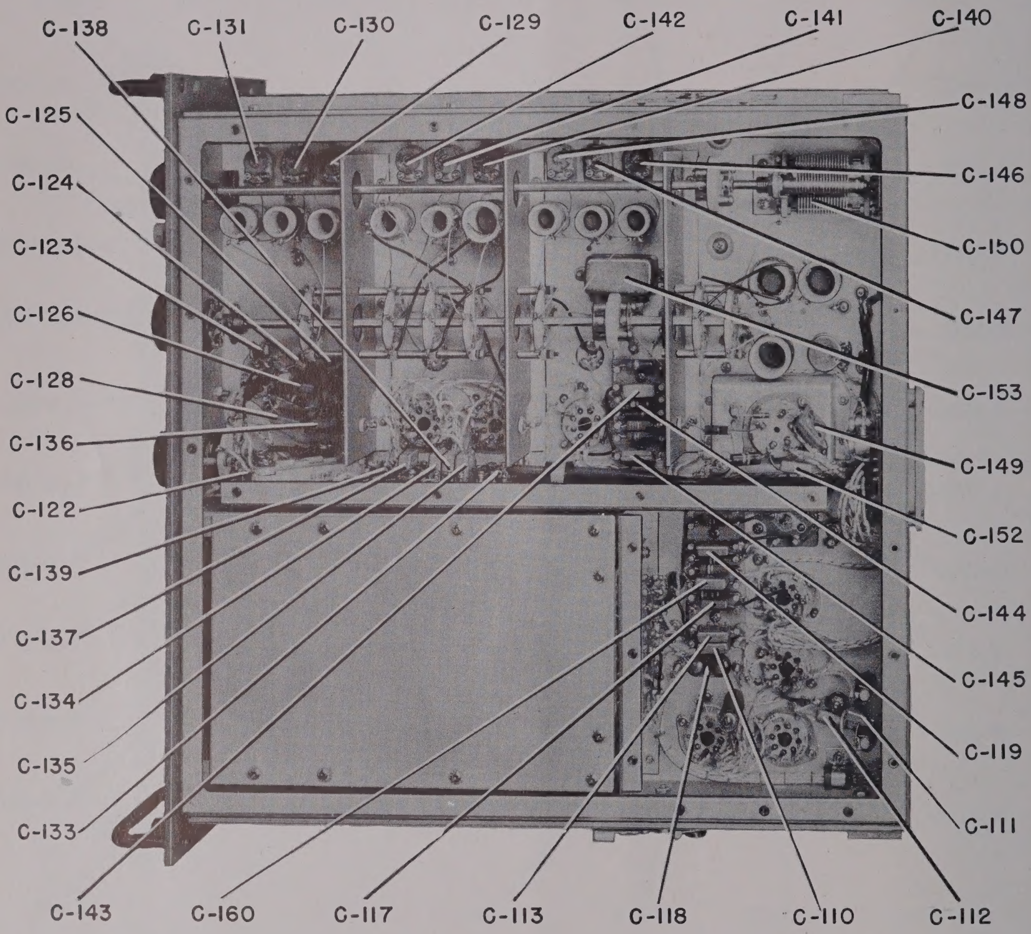


Figure 7–25. Capacitor Locations, Bottom View of Amplifier-Oscillator AM-655/URT

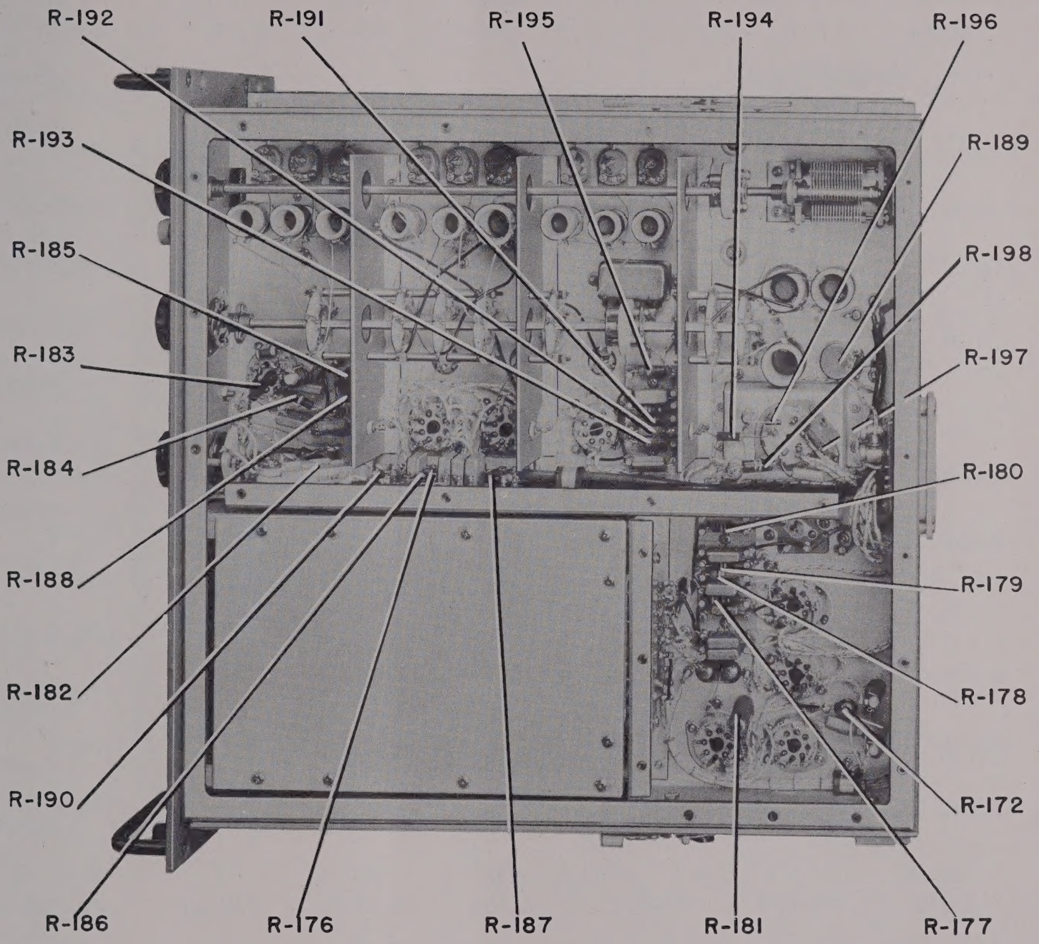


Figure 7–26. Resistor Locations, Bottom View of Amplifier-Oscillator AM-655/URT

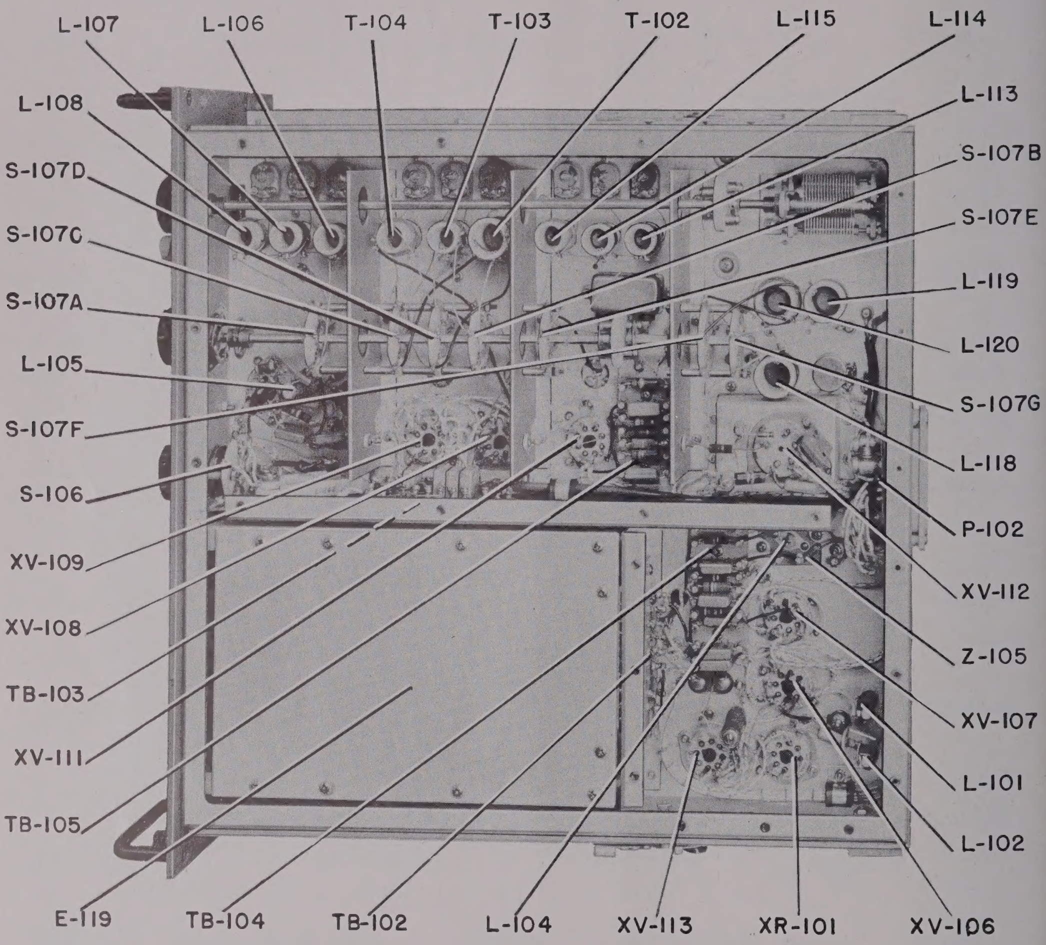


Figure 7–27. Miscellaneous Component Locations, Bottom View of Amplifier-Oscillator AM-655/URT

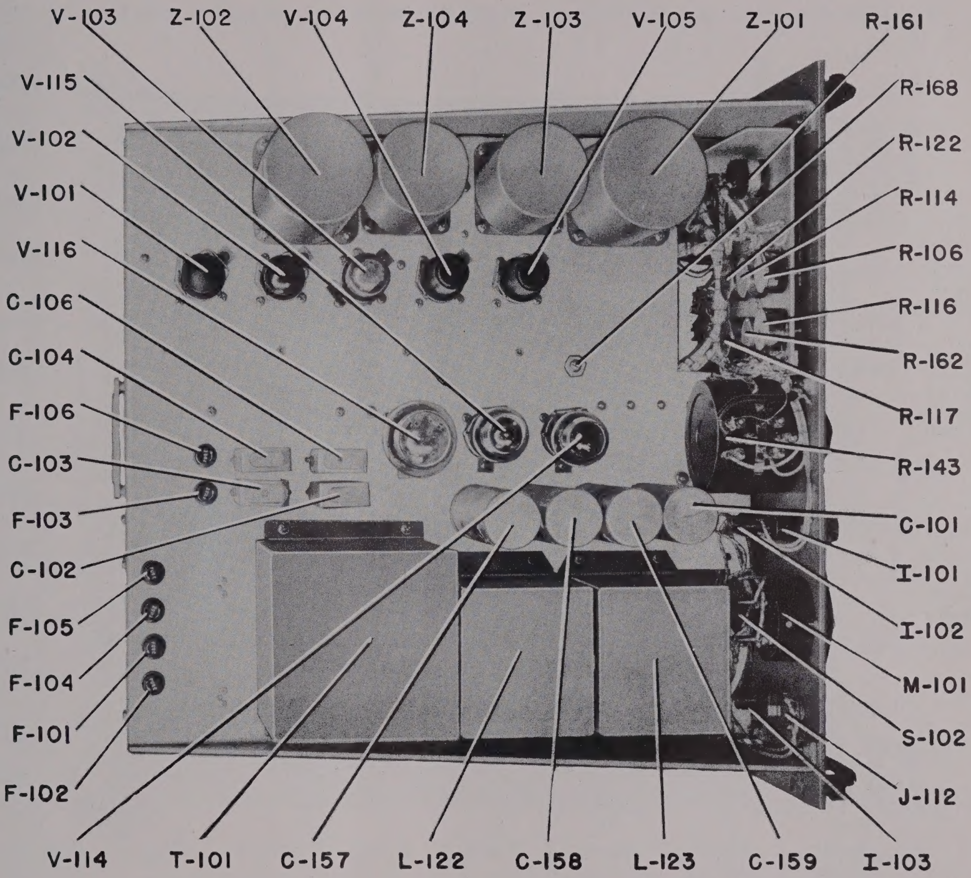


Figure 7–28. Component Locations, Top View of Modulator-Power Supply MD-165/URT

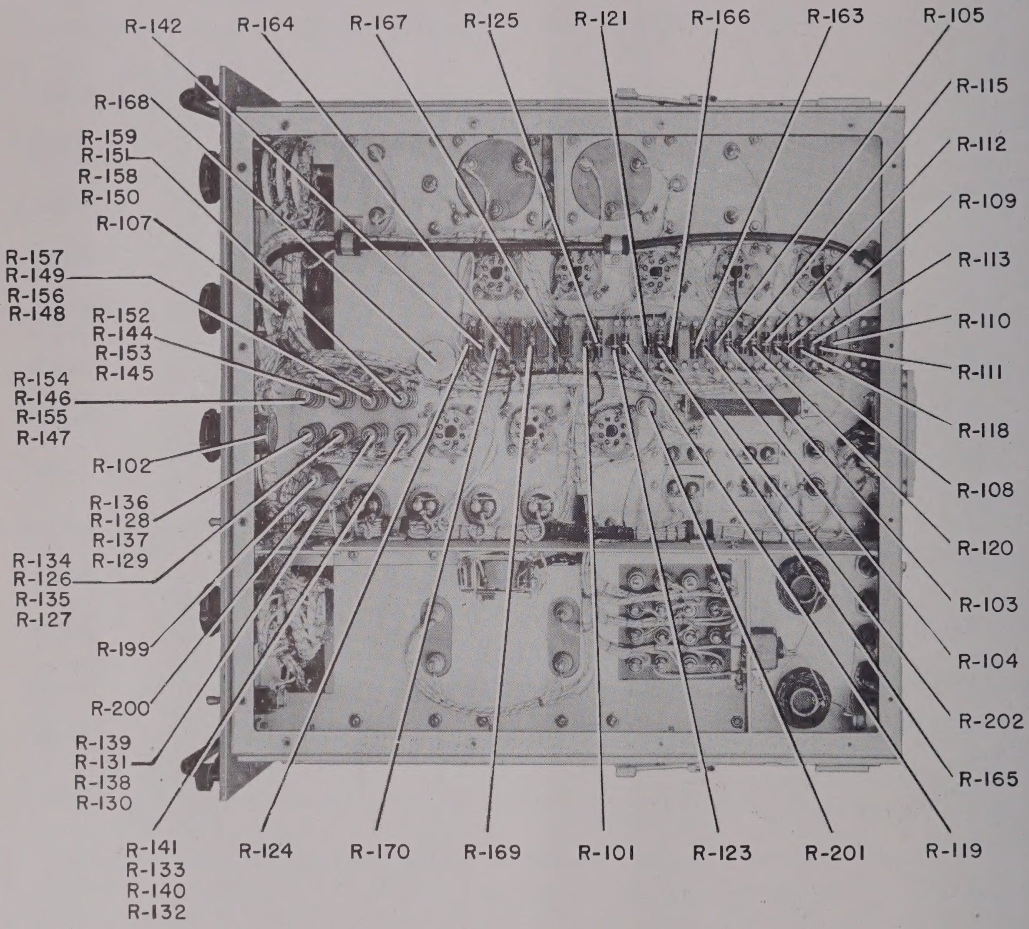


Figure 7–29. Resistor Locations, Bottom View of Modulator-Power Supply MD-165/URT

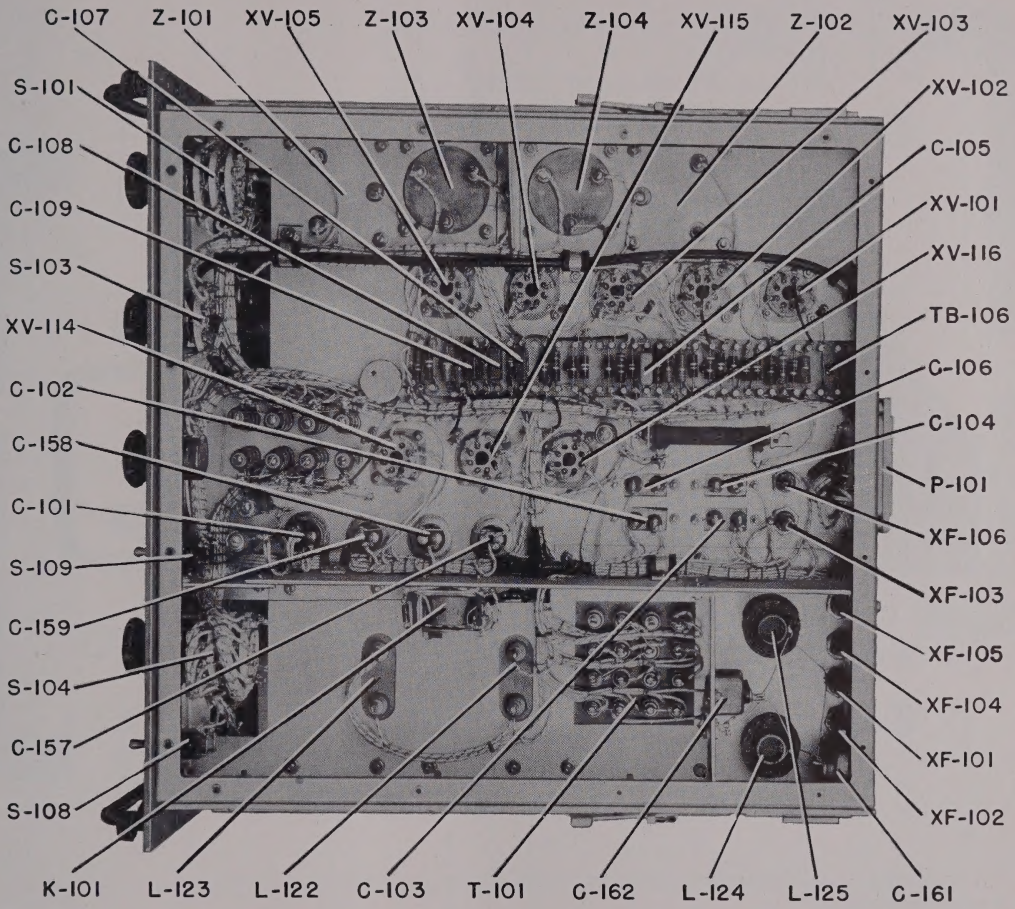


Figure 7–30. Capacitor and Miscellaneous Component Locations, Bottom View of Modulator-Power Supply MD-165/URT

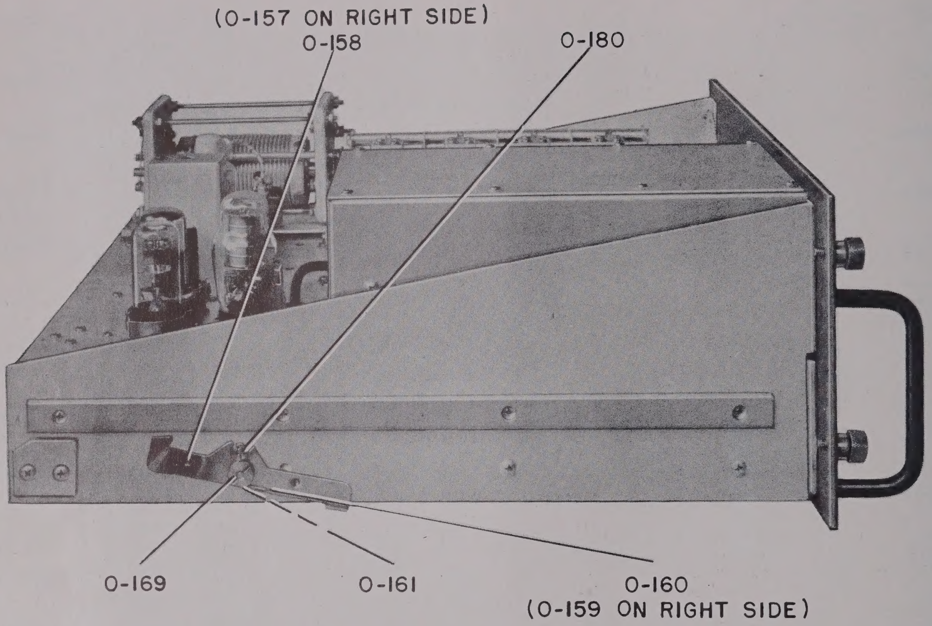


Figure 7–31. Slide Mechanism Part Locations, Left Side View of Amplifier-Oscillator AM-655/URT

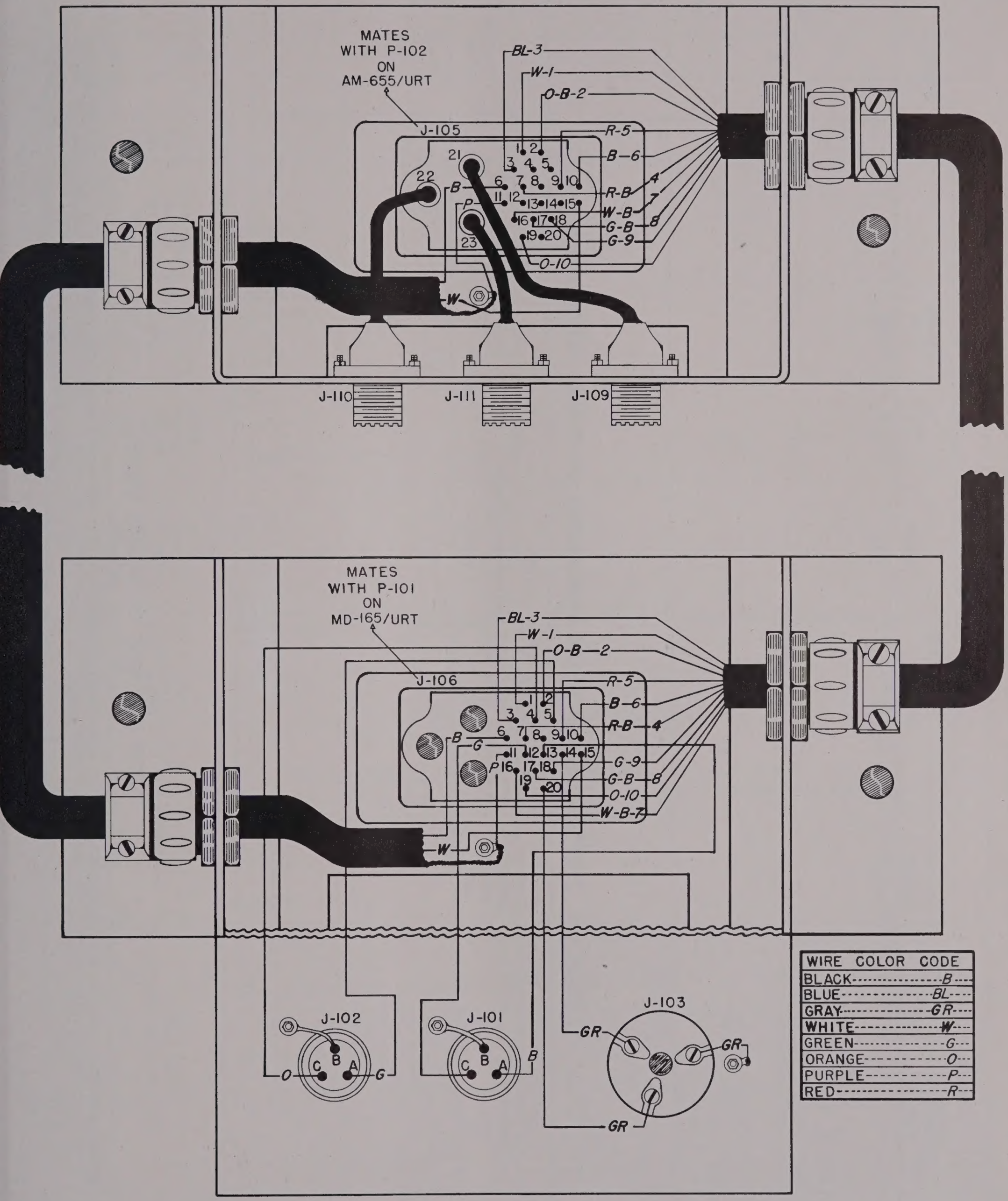


Figure 7–32. Practical Wiring Diagram of Blister Assembly, KY-58/GRT and KY-75/SRT Keyers

TABLE 8-1. WEIGHTS AND DIMENSIONS OF REPAIR PARTS BOXES

EQUIPMENT SPARES					
REPAIR PARTS BOX	OVERALL DIMENSIONS			VOLUME cu. ft.	WEIGHT lbs.
	HEIGHT	WIDTH	DEPTH		
1	12¼″	18¼″	9⅛″	1.18	52

TABLE 8-2. SHIPPING WEIGHTS AND DIMENSIONS OF REPAIR PARTS BOXES

EQUIPMENT SPARES						
SHIPPING BOX NO.	REPAIR PARTS BOX	OVERALL DIMENSIONS			VOLUME cu. ft.	WEIGHT lbs.
		HEIGHT	WIDTH	DEPTH		
1	1	13⅞″	21⅝″	10⅞″	1.89	65

TABLE 8-3. LIST OF MAJOR UNITS

SYMBOL GROUP	QUANTITY	LIST OF MAJOR UNIT	STANDARD NAVY STOCK NUMBER	DESIGNATION
101 to 299	1 or	Keyer	F16-K-47681-1001	KY-58/GRT
101 to 299	1	Keyer	F16-K-47672-9201	KY-75/SRT

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				PANELS								
A-101	Panel, indicator: aluminum w/gray enamel finish; 19″ lg × $6\frac{31}{32}$″ wd × $\frac{3}{16}$″ thk; mts by four threaded inserts, $\frac{3}{8}$″ diam and chamfered to $\frac{13}{32}$″ diam; on 18.312″ × 4.000″ mtg/c; special markings: "Carrier Calibrate," "Tuning," "Output Level," "Crystal Oscillator," "Frequency Range"; "Output Tuning"; panel photo etched according to dwg P654-I w/black characters on gray background; front panel for AM-655/URT panel	AM-655/URT front panel		‡	1; P654-1	P654-1	A-101	1				
A-102	Panel, indicator: aluminum; gray enamel finish; 19″ lg × $8\frac{23}{32}$″ wd × $\frac{3}{16}$″ thk; mts by eight threaded inserts, $\frac{3}{8}$″ diam and chamfered to $\frac{13}{32}$″ diam; inserts on irregularly spaced mtg/c; special markings: "Frequency Meter Audio," "Power," "On, Power," "Metering," "Multiplier," "Oven," "Plate," "On, Plate," "Deviation," "Photo Input," "Filter," "Phase Modulation," "Test Operate"; panel photo-etched according to dwg L609-1 w/black characters on gray background; front panel for MD-165/URT	MD-165/URT front panel		‡	1; L609-1	L609-1	A-102	1				
A-103*	Panel, blank: front panel; aluminum w/gray enamel finish; 19″ lg × $13\frac{31}{32}$″ wd × $\frac{3}{16}$″ thk; 8 mtg holes $\frac{1}{2}$″ lg × $\frac{1}{4}$″ wd on $18\frac{1}{4}$″ × $3\frac{1}{2}$″ mtg/c	Front panel		‡	1; P675-1	P675-1	A-103	1				
A-104*	Cabinet, electrical equipment: steel, w/gray enamel finish; empty; $22\frac{1}{8}$″ lg × 19″ wd × $41\frac{7}{16}$″ h; includes O-148, O-176, O-177	KY-58/GRT cabinet	CY-1132/GRT	‡	1; BM545	BM545	A-104	1				

* Supplied on KY-58/GRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				PANELS (continued)								
A-105†	Cabinet, electrical equipment: steel, w/gray enamel finish; empty; 22⅛″ lg × 22½″ wd × 24½″ h; includes O-149, O-150, O-193, O-197	KY-75/SRT cabinet	CY-1133/SRT	‡	1; BM546	BM546	A-105	1				
				CAPACITORS								
C-101	Capacitor, fixed: paper dielectric; 1 section; case style 15, MBCA ref dwg group 1; 2 mfd, −10% to +20%; 600 vdcw; hermetically sealed metal can; 2⅞″ lg × 1½″ diam; 2 solder lug type "B" term located at one end, spaced $\frac{5}{16}$″ apart min on phenolic pillars; oil impregnated char "D"; oil filled char "D"; no internal grd connection; ¾″-16 thrd mtg bushing ½″ lg w/hex nut; JAN-C-25 spec	Part of deviation control filter network	CP41B1DF205V	N16-C-49221-9933	14	H641-3	C-101	1				
C-102	Capacitor, fixed: paper dielectric; 1 section; case style 41, MBCA ref dwg group 1; 1mfd ±10%; 600 vdcw; hermetically sealed metal can; $1\frac{5}{16}$″ lg × $\frac{49}{64}$″ wd × 2¾″ h max; 2 solder lug term, ¾″ h max, located at one end, ⅝″ apart c to c, on porcelain pillars; requires single hole mtg clamp; JAN-C-25 spec	V-103 cathode-to V-104 cathode coupling	CP61B1EF105K	N16-C-48817-1090	14	L895-3	C-102, C-104	2				
C-103	Capacitor, fixed: paper dielectric; 1 section; case style 41, MBCA ref dwg group 1; 500,000 mmf ±10%; 600 vdcw; hermetically sealed metal can; $1\frac{5}{16}$″ lg × $\frac{49}{64}$″ wd × 2″ h; 2 solder lug term, ¾″ h max; located at one end, spaced ⅝″ apart c to c, on porcelain pillars; no internal grd connection; requires single hole mtg clamp; JAN-C-25 spec	Part of deviation-control filter network	CP61B1EF504K	N16-C-47297-1111	14	L895-5	C-103, C-106	2				
C-104	Same as C-102	V-105 cathode bypass										

C-105	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 10,000 mmf ±20%; 300 vdcw; no specified temp coef; molded bakelite case; $\frac{53}{64}$" lg × $\frac{11}{32}$" d × $\frac{53}{64}$" wd max; 2 axial wire lead term at each end; term mtd; JAN-C-5 spec	V-105 plate to V-104 grid coupling	CM35B103M	N16-C-33627-7705	173	H377-3	C-105, C-113, C-119, C-126, C-128, C-136, C-137, C-143, C-145, C-149, C-152, C-154, C-156, C-160, C-164	15					
C-106	Same as C-103	V-105 screen bypass											
C-107	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 1300 mmf ±5%; 500 vdcw; temp coef −20 to +100 parts/million/degree C; molded bakelite case; $\frac{53}{64}$" lg × $\frac{9}{32}$" d × $\frac{53}{64}$" wd max; 2 axial wire lead term at each end; term mtd; JAN-C-5 spec	Part of V-105 phase shifting network	CM30E132J	N16-C-31349-1699	14	H640-24	C-107, C-108, C-109	3					
C-108	Same as C-107	Part of V-105 phase shifting network											
C-109	Same as C-107	Part of V-105 phase shifting network											
C-110	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 1000 mmf ±10%; 500 vdcw; no specified temp coef; molded bakelite case; $\frac{53}{64}$" lg × $\frac{11}{32}$" d × $\frac{53}{64}$" wd; 2 axial wire lead term at each end; term mtd; JAN-C-5 spec	V-106 grid filter	CM35A102K	N16-C-31090-4203	242	J174-4	C-110	1					
C-111	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 4700 mmf ±10%; 500 vdcw; no specified temp coef; molded bakelite case; $\frac{53}{64}$" lg × $\frac{11}{32}$" d × $\frac{53}{64}$" wd max; 2 axial wire lead term at each end; term mtd; JAN-C-5 spec	Audio filter	CM35B472K	N16-C-32646-6808	173	H377-7	C-111, C-112, C-134, C-135, C-138	5					
C-112	Same as C-111	Audio filter											
C-113	Same as C-105	V-106 to V-107 coupling											
C-114	Capacitor, variable, air dielectric; 1 section, plate meshing type; 17 to 325 mmf; SLC tuning characteristic; 750 V.A.C. peak voltage; $2\frac{23}{32}$" lg × $1\frac{5}{8}$" wd × $1\frac{7}{8}$" h; $\frac{7}{16}$"-27 thrd bushing, $\frac{13}{32}$" lg;	Carrier Calibration control		N16-C-61716-5075	1; SA: 8754	SA: 8754	C-114, C-150	2					

† Supplied on KY-75/SRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				CAPACITORS (continued)								
C-114 (cont)	31/64″ lg × 0.250″ diam shaft; extension shaft adjustment, w/180° CCW rotation; ceramic insulated base; 2 solder lug terminals; single hole mtg by 7/16″-27 bushing and two #6-32 tapped holes 3/4″ c to c; contains 35 aluminum plates w/polished finish											
C-115	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 620 mmf ±5%; 500 vdcw; temp coef −20 to +100 parts/million/degree C; molded bakelite case; 53/64″ lg × 11/32″ d × 53/64″ wd max; 2 axial wire lead term; term mtd; JAN-C-5 spec; part of Z-106	V-106 grid to cathode	CM35E621J	N16-C-30373-1943	173	H377-16	C-115	1				
C-116	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 2700 mmf ±5%; 500 vdcw; temp coef −20 to +100 parts/million/degree C; molded bakelite case; 53/64″ lg × 11/32″ d × 53/64″ wd max; 2 axial wire lead term; term mtd; JAN-C-5 spec; part of Z-106	L-103 tuning	CM35E272J	N16-C-32140-4743	173	H377-18	C-116	1				
C-117	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 270 mmf ±10%; 500 vdcw; no specified temp coef; molded bakelite case; 51/64″ lg × 7/32″ d × 15/32″ wd max; 2 axial wire lead term; term mtd; JAN-C-5 spec	V-106 to V-107 coupling	CM20B271K (-481519-B10)	N16-C-29613-2676	242	H371-9	C-117, C-122, C-124	3				
C-118	Capacitor, fixed: paper dielectric; 1 section; case style 41, MBCA ref dwg group 1; 100,000 mmf ±10%; 600 vdcw; hermetically sealed metal can; 1 5/16″ lg × 49/64″ wd × 2 3/4″ h max; 2 solder lug term, 3/4″ h max, located at one end, 5/8″ apart c to c, on porcelain pillars; requires single hole mtg clamps; JAN-C-25 spec	V-107 plate filter	CP61B1EF104K	N16-C-45777-1074	14	L895-6	C-118	1				

C-119	Same as C-105	V-107 to Z-105 coupling										
C-120	Not used											
C-121	Capacitor, fixed: mica dielectric; case style no 22, MBCA ref dwg group 1; 4700 mmf ±5%; 500 vdcw; no specified temp coef; molded bakelite case; 53/64″ lg × 11/32″ dp × 53/64″ wd max; 2 axial wire lead term; term mtd; JAN-C-5 spec; part of Z-105	L-104 tuning	CM35B472J	N16-C-32641 -6328	173	H377-19	C-121	1				
C-122	Same as C-117	Ext Osc input coupling										
C-123	Capacitor, fixed: ceramic dielectric; case style no 2, MBCA ref dwg group 1; 22 mmf ±10%; temp coef −330 mmf/mf/°C; temp coef tolerance −718 to +500 mmf/mf/°C; insulated; phenolic jacket; 0.562″ lg × 0.250″ diam max; 2 axial wire lead term; term mtd; JAN-C-20 spec	V-110 grid to cathode feedback	CC21SL220K	N16-C-16157 -6400	83	H872-8	C-123, C-125	2				
C-124	Same as C-117	V-110 cathode bypass										
C-125	Same as C-123	V-110 fixed plate tuning										
C-126	Same as C-105	V-110 screen bypass										
C-127	Capacitor, variable, air dielectric: plate meshing type; 4 sections; 375 mmf max, 12.5 mmf min; straight line frequency tuning characteristic; 700 v 60 cycles AC peak voltage; 8½″ lg × 1 27/32″ h × 3 3/16″ wd excl shaft; shaft 1″ lg × 0.250″ diam; extension shaft adjustment; 180° CCW rotation; ceramic insulated base; 8 solder lug term; four 0.130″ diam mtg holes, 2 at each end of front plate 7/8″ c to c; 25 aluminum plates per section w/polished finish	Main tuning control		N16-C-63576 -1001	284	P633-1	C-127					
C-127A	Part of C-127	V-110 plate tuning										
C-127B	Part of C-127	V-108 plate tuning										
C-127C	Part of C-127	V-109 plate tuning										
C-127D	Part of C-127	V-111 plate tuning										
C-128	Same as C-105	V-110 output coupling										

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
CAPACITORS (continued)												
C-129	Capacitor, variable: ceramic dielectric; single section rotary type; temp coef −300 parts/million/°C; 3.0 to 13 mmf capacity; 500 vdcw; 27/32″ lg × 41/64″ wd × 13/32″ d max; 2 solder lug type term located on each side; two 0.120″ diam mtg holes spaced 0.438″ c to c in base; screwdriver slot adjustment; steatite base; JAN-C-81 spec	L-106 tuning	CV11B130	N16-C-63965-2800	83	K277-6	C-129, C-130, C-131, C-140, C-141, C-142, C-146, C-147, C-148	9				
C-130	Same as C-129	L-107 tuning										
C-131	Same as C-129	L-108 tuning										
C-132	Not used											
C-133	Capacitor, fixed: ceramic dielectric; case style no 2, MBCA ref dwg group 1; 47 mmf ±10%; temp coef −330 mmf/mf/°C; temp coef tolerance −718 to +500 mmf/mf/°C; insulated; phenolic jacket; 0.562″ lg × 0.250″ diam, max; 2 axial wire lead term; term mtd; JAN-C-20 spec	V-108 fixed plate tuning	CC21SL470K	N16-C-16541-7014	83	H872-5	C-133, C-139, C-144	3				
C-134	Same as C-111	V-108 screen bypass										
C-135	Same as C-111	V-108 cathode bypass										
C-136	Same as C-105	V-110 to V-108 and V-109 coupling										
C-137	Same as C-105	V-109 plate filter										
C-138	Same as C-111	V-109 cathode bypass										
C-139	Same as C-133	V-109 fixed plate tuning										
C-140	Same as C-129	T-102 tuning										

C-141	Same as C-129	T-103 tuning										
C-142	Same as C-129	T-104 tuning										
C-143	Same as C-105	V-111 screen by-pass										
C-144	Same as C-133	V-111 fixed plate tuning										
C-145	Same as C-105	V-111 to V-112 coupling										
C-146	Same as C-129	L-113 tuning										
C-147	Same as C-129	L-114 tuning										
C-148	Same as C-129	L-115 tuning										
C-149	Same as C-105	V-112 cathode by-pass										
C-150	Same as C-114	Output tuning control										
C-151	Not used											
C-152	Same as C-105	V-112 screen by-pass										
C-153	Capacitor, fixed: paper dielectric; 1 section; case style no 40, MBCA ref dwg group 1; 100,000 mmf ±10%; 600 vdcw; hermetically sealed metal can; 1 13/16″ lg × 1″ wd × ¾″ dp; 3 solder lug term, ¾″ h, max, located on top, spaced ½″ apart c to c, on porcelain pillars; no internal ground connections; two 3/16″ diam mtg holes on 2⅛″ mtg/c; JAN-C-25 spec	V-112 plate filter	CP54B1EF104K	N16-C-45777 -3177	14	H564-3	C-153	1				
C-154	Same as C-105	V-112 output coupling										
C-155	Capacitor, fixed: ceramic dielectric; case style no 2, MBCA ref dwg group 1; 5 mmf ±0.25 mmf; temp coef −330 mmf/mf/°C; temp coef tolerance −718 to +500 mmf/mf/°C; insulated; phenolic jacket; 0.562″ lg × 0.250″ diam, max; 2 axial wire lead term; term mtd; JAN-C-20 spec	V-112 to J-110 coupling	CC21SL050C	N16-C-15625 -4505	83	H872-9	C-155	1				
C-156	Same as C-105	V-112 plate RF filter										
C-157	Capacitor, fixed: paper dielectric; 1 section; case style no 15, MBCA ref dwg group 1; 4 mfd, −10% to +20%; 600 vdcw; hermetically	Power supply filter	CP41B1DF405V	N16-C-49981 -9993	14	H641-2	C-157, C-158, C-159	3				

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				CAPACITORS (continued)								
C-157 (cont)	sealed metal can; $4\frac{1}{2}''$ lg × $1\frac{1}{2}''$ diam; 2 solder lug type "B" term, $\frac{7}{8}''$ h max, located at one end, spaced $\frac{5}{16}''$ apart, min, on porcelain pillars; no internal grd connections; $\frac{3}{4}''$ × 16 thrd single hole mtg bushing; JAN-C-25 spec											
C-158	Same as C-157	Power supply filter										
C-159	Same as C-157	Power supply filter										
C-160	Same as C-105	V-107 screen bypass										
C-161	Capacitor, fixed: paper dielectric; 2 sections; case style no 40, MBCA ref dwg group 1; 100,000 mmf per section, +20 %−10%; 600 vdcw; hermetically sealed metal can; $1\frac{13}{16}''$ wd × 1″ d × $\frac{3}{4}''$ h; 3 solder lug term, $\frac{3}{4}''$ h max, located on top, spaced $\frac{1}{2}''$ apart c to c, on porcelain pillars; internally grounded; two $\frac{3}{16}''$ diam mtg holes on $2\frac{1}{8}''$ mtg/c; JAN-C-25 spec	AC line filter	CP54B6EF104V	N16-C-53204-4098	13	H564-4	C-161, C-162	2				
C-161A	Part of C-161											
C-161B	Part of C-161											
C-162	Same as C-161	AC line filter										
C-162A	Part of C-162											
C-162B	Part of C-162											
C-163	Not used											
C-164	Same as C-105	V-111 plate bypass										
				MISCELLANEOUS ELECTRICAL PARTS								
E-101*	Blister assembly: multiconnector; consists of two rectangular com-	Blister assembly			1; SA:7284	SA:7284	E-101	1				

E-101* (cont)	partments electrically connected by 2 cables and containing various receptacle connectors peculiar to National Company, Inc. part/dwg SA:7284; each compartment 10¼″ lg × 4⅜″ wd × 4$\frac{3}{32}$″ d; mts by 4 captive thumb nuts, 2 on each compartment spaced diagonally on 8¾″ × 1⅛″ mtg/c; marked: Keyer Output, Freq Meter, RF Ext Oscillator, FM Audio, Keyline, AC Power; includes J-101, J-102, J-103, J-105, O-186, O-187, O-188, O-189, O-190, O-143, O-161, J-109, J-110, J-111, J-106											
E-102	Insulator, standoff: grade XXP natural bakelite; wax impregnated; flat plate, rectangular w/rounded end shape, MBCA ref dwg group 9, item code no 225, MBCA ref dwg group 9; 1″ lg × ¾″ wd; two 0.125″ diam mtg holes on 0.438″ mtg/c; ¼″ from flat end; JAN-P-13 spec	Variable trimmer capacitor insulated spacers			68	P349-4	E-102	9				
E-103	Insulator, bushing: grade L-5 white ceramic; round, flat w/flange, MBCA ref dwg group 9; item code no 210, MBCA ref dwg group 9; D-0.362″, B-0.187″, T-0.125″, E-0.094″; 0.093″ diam ctr hole	Feedthru insulators		N17-I-49475 -1171	254; D868	K673-1	E-103	18				
E-104	Insulator, standoff: grade L-4 white ceramic; side surfaces glazed; standoff, cylindrical pillar MBCA ref dwg group 9; item code no 19 MBCA ref dwg group 9; L-½″, C-$\frac{3}{16}$″, D-⅜″, T-6-32″	C-128, R-184 R-196, R-198 mtg		N17-I-69154 -6206	86	M040-1	E-104	4				
E-105	Knob: round black bakelite; designed to accommodate round shaft ¼″ diam w/$\frac{9}{16}$″ deep shaft hole, fastened w/two #8-32 set screws; cadmium plated brass insert; 1⅝″ lg × 1½″ diam × ⅞″ thk; arrow marking $\frac{1}{32}$″ wd × $\frac{1}{16}$″ d groove filled w/white lacquer	Freq Range sw knob		N16-K-700346 -101	1; SA:8880	SA:8880	E-105 thru E-112	8				
E-106	Same as E-105	Crystal Osc sw knob										
E-107	Same as E-105	Test Op sw knob										
E-108	Same as E-105	Phase Mod Cont knob										
E-109	Same as E-105	Filter sw knob										
E-110	Same as E-105	Photo Input cont knob										

* Supplied on KY-58/GRT only

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
	MISCELLANEOUS ELECTRICAL PARTS (continued)											
E-111	Same as E-105	Multiplier sw knob										
E-112	Same as E-105	Metering sw knob										
E-113	Knob: round black bakelite; designed to accommodate round shaft $\frac{1}{4}''$ diam w/$\frac{1}{2}''$ deep shaft hole, fastened w/two #8-32 set screws; w/o markings; cadmium plated brass insert; $1\frac{1}{16}''$ diam × $\frac{5}{8}''$ thk	Access door knobs		N16-K-700310 -997‡	1; SA:7304	SA:7304	E-113, E-118	2				
E-114	Knob: round black bakelite; designed to accommodate round shaft 0.250″ diam w/$\frac{9}{16}''$ deep shaft hole, fastened w/set screws; cadmium plated brass insert; scored line on clear vinylite dial pointer; $2\frac{23}{32}''$ lg × 2″ diam × $\frac{7}{8}''$ thk; two #8-32 tapped mtg holes; one located at 6 o'clock and one at 9 o'clock	Tuning control knob and pointer			1; SA:8879	SA:8879	E-114	1				
E-115	Knob: round black bakelite; designed to accommodate round shaft 0.375″ diam w/$\frac{9}{16}''$ deep shaft hole, fastened w/set screws; cadmium plated brass insert; w/o markings; 2″ diam × $\frac{27}{32}''$ thk; two #8-32 tapped mtg holes, one located at 6 o'clock and one at 9 o'clock	Deviation control knob			1; SA:8889	SA:8889	E-115	1				
E-116	Knob: round black bakelite; designed to accommodate round shaft 0.250″ diam w/$\frac{9}{16}''$ deep shaft hole, fastened w/set screws; cadmium plated brass insert; w/o markings; 2″ diam × $\frac{27}{32}''$ thk; two #8-32 tapped mtg holes, one located at 6 o'clock and one at 9 o'clock	Carrier Calib control knob			1; SA:8895	SA:8895	E-116, E-117	2				
E-117	Same as E-116	Output tuning knob										
E-118	Same as E-113	Control knob										

E-119	Oven, crystal: for 6 crystal units in 3 crystal holders type HC-1/U or in 3 crystal holders type HC-6/U; 70°C oven temp ±1°C tolerance; operates on 115/230 v, 50/60 cycles, single phase, 305 watts; built-in thermometer w/0°C to 100°C range; 9 double-ended stud type term on back of oven; aluminum case, $10\frac{13}{16}''$ lg × $7\frac{7}{8}''$ wd × $6\frac{25}{64}''$ h; eight 0.218″ diam mtg holes on irregularly spaced mtg/c; holds 3 of 1 type crystal at one time only; includes Z-106, XY-101 thru XY-106, O-140, O-141, O-142, O-137, O-138, O-139, S-110, HR-101 thru HR-104, O-181, O-182, O-183, O-185, TB-101	Crystal oven		‡	1; SA:8877	SA:8877	E-119	1				
E-120	Insulator, standoff: grade L-4 white ceramic; glazed surface; cylindrical pillar shape MBCA ref dwg group 9; item code no 20; C-$\frac{3}{8}''$, D-$\frac{1}{4}''$, T-#6-32 tap, L-$1\frac{15}{16}''$; single #6-32 tapped mtg hole in base of pillar	L-117 standoff insulator			46	B837-1	E-120	1				
E-121	Cap, tube: grid-plate style 9, MBCA ref dwg group 37; beryllium copper grip w/ceramic cap; grip tinned, cap glazed finished; $1\frac{1}{8}''$ lg × $\frac{5}{8}''$ wd × $\frac{17}{32}''$ h; ceramic insulation; single cap type term; 0.369″ max jaw opening; used as electron tube contact clip	V-112 plate cap grip		N17-C-800646 -151	1; SA:91	SA:91	E-121	1				
E-122†	Blister assembly: multiconnector; consists of 2 rectangular compartments electrically connected by 2 cables and containing various receptacle connectors peculiar to National Company, Inc. part/dwg SA:7285; each compartment $10\frac{1}{4}''$ lg × $4\frac{3}{8}''$ wd × $4\frac{3}{32}''$ d; mtd by 4 captive thumb nuts, 2 on each compartment spaced diagonally on $8\frac{3}{4}''$ × $1\frac{1}{8}''$ mtg/c; marked: keyer output, freq meter, RF ext oscillator, FM audio, Keyline, AC power; includes J-101, J-102, J-103, J-105, J-106, J-109, J-110, J-111, O-186 thru O-190, O-143, O-161	Blister assembly		‡	1; SA:7285	SA:7285	E-122	1				
					FUSES							
F-101	Fuse, cartridge: 8 amp, 250 volt; continuous 110%, blows within 60 minutes at 135%; ferrule type,	AC line fuse	(-28032-8)	N17-F-16302 -160	76	F135-17	F-101, F-102, F-104, F-105	4				

† Supplied on KY-75/SRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				FUSES (continued)								
F-101 (cont)	$\frac{1}{4}$" lg × $\frac{1}{4}$" diam; glass body; one time; visual inspection of fuse wire continuity thru glass tube enclosure; 1$\frac{1}{4}$" lg × $\frac{1}{4}$" diam											
F-102	Same as F-101	AC line fuse										
F-103	Fuse, cartridge: $\frac{1}{2}$ amp, 250 volt; continuous 110%, blows within 60 minutes at 135%; ferrule type $\frac{1}{4}$" lg × $\frac{1}{4}$" diam; glass body; one time; visual inspection of fuse wire continuity thru glass tube enclosure; 1$\frac{1}{4}$" lg × $\frac{1}{4}$" diam	B+ fuse	(-28032-$\frac{1}{2}$)	N17-F-16302-60	76	F135-13	F-103, F-106	2				
F-104	Same as F-101	F-101 spare										
F-105	Same as F-101	F-102 spare										
F-106	Same as F-103	F-103 spare										
				HARDWARE								
H-101	Wrench: allen set screw; $\frac{5}{64}$" across flats; 1$\frac{61}{64}$" × $\frac{11}{16}$" o/a; cadmium plated steel; L-shaped hexagonal metal rod; for #8 allen set screw	Allen wrench		N41-W-2446	1; F131-7	F131-7	H-101	1				
H-102	Bolt, machine: brass, nickel plated; rd head w/Phillips head drive; flat point; #10-32 NFT class 2 fit, 1$\frac{1}{2}$" lg	Supplementary blister mtg screws		‡	1; G965-20	G965-20	H-102	4				
				INDICATING DEVICES								
I-101	Lamp, incandescent: 6-8 v, 0.15 amp; miniature bayonet base MBCA ref dwg group 7, T-3$\frac{1}{4}$ bulb, clear; brown bead color; single CR filament; 1$\frac{3}{8}$" max o/a height; any burning position	Oven indicator	TB-14	G17-L-6297	18	F136-6	I-101, I-102, I-103	3				
I-102	Same as I-101	Plate indicator										
I-103	Same as I-101	Power indicator										

JACKS

J-101	Connector, receptacle: 3 round male contacts; polarized; straight; 29/32″ lg × 1 3/16″ wd × 1 3/16″ h; excl protruding contacts; cylindrical shaped aluminum body w/clear lacquer finish; molded phenolic insert; 23/32″ diam cable opening; four 0.120″ diam mtg holes, 5/64″ lg, 29/32″ c to c; 7/8″-20 thrd coupling; AN-C-591 spec; part of E-101 or E-122	Key line connector	AN 3102-14S-1P	N17-C-72604 -1338	128	P604-1	J-101, J-102	2				
J-102	Same as J-101; part of E-101 or E-122	Audio Freq meter connector										
J-103	Connector, receptacle: 3 flat male contacts; polarized; straight; 2.312″ lg × 1.750″ wd; 1.125″ h; 10 amps, 250 v; steel plated cylindrical body; locking type; molded black bakelite insert; two 0.156″ diam mtg holes on 1.937″ mtg/c; flush base; part of E-101 or E-122	AC power connector		N17-C-73471 -6417	93; 7556G	P615-1	J-103	1				
J-104	Not used‡											
J-105	Connector receptacle: 20 round female contacts and 3 coaxial male contacts; straight type; 3 3/8″ lg × 1 37/64″ wd × 1 11/16″ h; 8 amp, 250 v; aluminum alloy rectangular shaped body w/tin plate and clear lacquer finish; melamine "G" insert; four 0.144″ diam mtg holes, 5/32″ lg, on 1″ × 2.875″ mtg/c; coax, solid connectors and associated hardware silver plated; 1/16″ raised characters; adapter bushing furnished to accommodate RG-59/U cable in each coaxial fitting; part of E-101 or E-122	Multiconnector receptacle			339	P645-1	J-105	1	1	1	1	1
J-106	Connector, receptacle: 20 round female contacts; straight type; 3 3/8″ lg × 1 37/64″ wd × 1 11/16″ h; 8 amps, 250 v; aluminum alloy rectangular shaped body w/tin plate and clear lacquer finish; melamine "G" insert; four 0.144″ diam mtg holes, 5/32″ lg, on 1″ × 2.875″ mtg/c; connectors and associated hardware silver plated; 1/16″ raised characters; part of E-101 or E-122; Same as J-105 less the three coaxial connectors	Multiconnector receptacle		(For replacement use J-105 by removing coaxial connectors)	339	P645-2	J-106	1				
J-107	Not used											
J-108	Not used											

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				JACKS (continued)								
J-109A	Connector, receptacle: single round female contact; straight type; 19/32″ lg × 1″ wd × 1″ h; excl protruding contacts; round silver plated steel body; molded phenolic insert; four 0.125″ diam mtg holes on 0.719″ mtg/c; 5/8″-24 thrd coupling; part of E-101 or E-122	Ext Osc connector	SO-239 (-49194)	N17-C-73108 -5890‡	262	P506-1	J-109, J-110, J-111	3				
J-109B	Shell, electrical connector: brass, silver plate finish; rectangular base w/cylindrical hood shape; 1″ lg × 1″ wd × 3/4″ dp; four 1/8″ diam mtg holes on 23/32″ × 23/32″ mtg/c; used as inner hood on receptacle connector	J-109 inner hood			1; H969-1	H969-1	J-109B J-110B J-111B	3				
J-109C	Shell, electrical connector: brass, silver plate finish; rectangular base w/cylindrical hood shape; 1″ lg × 1″ wd × 7/16″ dp; four 1/8″ diam mtg holes on 23/32″ × 23/32″ mtg/c; used as outer hood on receptacle connector	J-109 outer hood			1; H969-2	H969-2	J-109C J-110C J-111C	3				
J-110	Same as J-109A; part of E-101 or E-122	RF Freq meter connector										
J-110B	Same as J-109B	J-110 inner hood										
J-110C	Same as J-109C	J-110 outer hood										
J-111	Same as J-109A; part of E-101 or E-122	Keyer output connector										
J-111B	Same as J-109B	J-111 inner hood										
J-111C	Same as J-109C	J-111 outer hood										
J-112	Jack, telephone: for 2 conductor plug; 0.250″ diam × 1.00″ lg shank; contact arrangement J1-A; MBCA ref dwg group 4; 1.271″ lg × 1.00″ wd × 0.750″ h; requires 3/8″-32 thd bushing, 5/16″ lg; hex nut and washer mtg accessory; JAN-J-641 spec	Audio Freq meter jack	(-49025B)	N17-J-39248 -4423	5	H464-2	J-112	1				

RELAYS												
K-101	Relay, armature: single-pole single throw; normally open; single break; AC-DC; 300 VDC, 100 ma contact rating; 1 inductive winding; 115 VAC, AC; 2 term on contact; 2 term on coil; vacuum impregnated for high humidity; $2\frac{7}{16}$" lg × $1\frac{1}{2}$" wd × $1\frac{1}{2}$" d; mtd by means of 2 mtg posts $\frac{3}{16}$" high w/tapped 6-32 thread, mtg posts $1\frac{3}{8}$" c to c	B minus relay		N17-R-64246 -4619	1302	P610-1	K-101	1				
INDUCTORS												
L-101	Choke, RF: 75 ma current rating; grid lead RF choke; for use at audio frequencies; cylindrical shape; $1\frac{15}{16}$" lg × $\frac{9}{16}$" dia, excl term; 2 solder lug term located one on each end of coil form	Audio filter			1; SA:4884	SA:4884	L-101, L-102	2	1	1	1	1
L-102	Same as L-101	Audio filter										
L-103	Coil, RF: 205 microhenries overall, 10 microhenries to tap, at 1000 cycles; 2.89 ohms overall, 0.52 ohms to tap, DC resistance; 99 turns total, 20 turns to tap; #10/41 ESN copper conductor, 1 pie universal wnd; tapped at 20 turns; unshielded; glass melamine form; air core; coil $\frac{29}{32}$" diam × $\frac{3}{32}$" lg; coil form $2\frac{13}{16}$" lg × $\frac{1}{2}$" diam; 3 wire pigtail type term located on universal wnd coil; mts between 2 plates of can; part of Z-106	Z-106 tuning			1; SA:8886	SA:8886	L-103	1	1	1	1	1
L-104	Coil, RF: 117 microhenries overall, 43 microhenries to tap at 1000 cycles; 1.24 ohms overall, 1.12 ohms to tap, DC resistance; 90 turns total, 45 turns to tap; #10/41 ESN copper conductor; 1 winding, 2 pie universal wnd; tapped at 45 turns; glass melamine form; air core; coil $\frac{23}{32}$" diam × $\frac{7}{16}$" lg; coil form $2\frac{13}{16}$" lg × $\frac{1}{2}$" diam; 3 wire pigtail term, located on universal wnd coil; mts between 2 mtg plates of can; part of Z-105	Z-105 tuning			1; SA:8885	SA:8885	L-104	1	1	1	1	1
L-105	Choke, RF: 125 ma current rating; cylindrical shape; $1\frac{15}{16}$" lg × $\frac{1}{2}$" diam excl term; 2 solder lug term located one on each end of coil form	V-110 cathode lead			1; SA:35A	SA:35A	L-105	1	1	1	1	1

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
INDUCTORS (continued)												
L-106	Coil, RF: 5.45 microhenries at 1000 cycles, 0.148 ohms DC resistance; 17 turns of #26AWG enamel coated copper conductor; single winding, single layer wound; untapped, unshielded; ceramic form w/powdered iron core; coil 19/32″ lg × 25/32″ dia, excl term; coil form 1 9/16″ lg × 3/4″ dia; adjustable iron core tuning w/screw-driver adjustment located on bottom of coil form; 2 solder lug term located one on each end; one 1/4″-32 thrd mtg bushing, 11/16″ lg, through bottom of coil form	Crystal osc tank, 3.5-6.7 mcs			1; SA:8864	SA:8864	L-106	1				
L-107	Coil, RF: 23.7 microhenries at 1000 cycles, 0.316 ohms DC resistance; 36 turns of #26AWG enamel coated copper conductor; single winding, single layer wound; untapped, unshielded; ceramic form w/powdered iron core; coil 5/8″ lg × 25/32″ dia; coil form 1 9/16″ lg × 3/4″ diam; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; 2 solder lug term, located one on each end; one 1/4″-32 thrd mtg bushing, 11/16″ lg, through bottom of coil form	Crystal osc tank, 1.8-3.5 mcs			1; SA:8865	SA:8865	L-107	1				
L-108	Coil, RF: 102 microhenries at 1000 cycles, 1.825 ohms DC resistance; 52 turns of #10/41 litz wire each strand of wire enamel covered w/all 10 strands having a single nylon covering; single winding, universal wound; untapped, unshielded; ceramic form, w/powdered iron core; coil 1/8″ lg × 1″ dia; coil form 1 9/16″ lg × 3/4″ dia; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; 2 solder lug term, located one on each end; one 1/4″-32 thrd mtg bushing, 11/16″ lg, through bottom of coil form	Crystal osc tank, 1.0-1.8 mcs			1; SA:8866	SA:8866	L-108	1				

L-109	Not used											
L-110	Not used											
L-111	Not used											
L-112	Not used											
L-113	Coil, RF: 4.5 microhenries at 1000 cycles, 0.13 ohms DC resistance; 15 turns #26AWG enamel coated copper conductor; single winding, single layer wound; untapped, unshielded; ceramic form; w/powdered iron core; coil 9/16″ lg × 25/32″ diam; coil form 1 9/16″ lg × 3/4″ diam; adjustable iron core w/screwdriver adjustment located on bottom of coil form; 2 solder lug term, located one on each end; one 1/4″-32 thrd mtg bushing, 11/16″ lg, through bottom of coil form	Buffer tank, 3.5-6.7 mcs			1; SA:8870	SA:8870	L-113	1	1	1	1	1
L-114	Coil, RF: 17.1 microhenries at 1000 cycles, 0.256 ohms DC resistance; 28 turns #26 enamel coated copper conductor; single winding; single layer wound; untapped, unshielded; ceramic form w/powdered iron core; coil 1/2″ lg × 25/32″ dia; coil form 1 9/16″ lg × 3/4″ dia; adjustable iron core w/screw driver adjustment located on bottom of coil form; 2 solder lug term located one on each end; one 1/4″-32 thrd mtg bushing through bottom of coil form	Buffer tank, 1.8-3.5 mcs			1; SA:8871	SA:8871	L-114	1	1	1	1	1
L-115	Coil, RF: 67 microhenries at 1000 cycles, 1.345 ohms DC resistance; 41 turns #10/41 litz wire, each strand enamel coated w/all 10 strands having a single nylon covering; single winding, universal wound; untapped, unshielded; ceramic form, w/powdered iron core; coil 1/8″ lg × 15/16″ dia; coil form 1 9/16″ lg × 3/4″ dia; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; 2 solder lug term located one on each end; one 1/4″-32 thrd mtg bushing through bottom of coil form	Buffer tank, 1.0-1.8 mcs			1; SA:8872	SA:8872	L-115	1	1	1	1	1
L-116	Coil, RF: 5.0 mh at 1000 cycles, 20 ohms DC resistance, 300 ma; 1020 turns, #32 AWG, enamel single nylon covered copper conductor; 1 winding, 3 pie universal wnd; untapped, unshielded; ce-	RF Filter			1; SA:4014	SA:4014	L-116	1	1	1	1	1

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				INDUCTORS (continued)								
L-116 (cont)	ramic form and core; coil 25/32" dia × 3/4" lg o/a; coil form 1 15/16" lg × 3/8" OD; 2 cotter pin type terminations, located one at each end; single #6-32 tapped mtg hole, 3/8" dp, located in base of coil form; RF choke coil											
L-117	Choke, RF: plate lead RF choke; for use w/frequencies of 1-7 mcs; cylindrical shape; 3/4" lg × 3/16" dia, excl term; 2 wire pigtail type term located on each end of coil form	V-112 plate lead			1; SA:6073	SA:6073	L-117	1	1	1	1	1
L-118	Coil, RF: 78 microhenries at 1000 cycles 0.052 ohms DC resistance; 17 turns #20 AWG enamel coated copper conductor; single winding, single layer wound; untapped, unshielded; ceramic form w/powdered iron core; coil 19/32" lg × 1 1/16" dia; coil form 1 13/16" lg × 1" dia; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; 2 solder lug term, located one on each end; one 1/4"-32 thrd mtg bushing, 11/16" lg, through bottom of coil form	Output tank, 3.5-6.7 mcs			1; SA:8873	SA:8873	L-118	1	1	1	1	1
L-119	Coil, RF: 32 microhenries at 1000 cycles, 0.414 ohms DC resistance; 34 turns #26 AWG enamel coated copper conductor; single winding, single layer wound; center tapped; unshielded; ceramic form w/powdered iron core; coil 19/32" lg × 1 1/32" dia; coil form 1 13/16" lg × 1" dia; adjustable iron core tuning w/screwdriver adjustment located on top of coil form; 3 solder lug term, located one on bottom and 2 on top end of coil form; one 1/4"-32 thrd mtg bushing, 11/16" lg, through bottom of coil form	Output tank, 1.8-3.5 mcs			1; SA:8874	SA:8874	L-119	1	1	1	1	1
L-120	Coil, RF: 108 microhenries at 1000 cycles, 0.738 ohms DC resistance;	Output tank, 1.0-1.8 mcs			1; SA:8875	SA:8875	L-120	1	1	1	1	1

L-120 (cont)	56 turns #10/41 litz wire, each strand enamel coated, all ten strands having a single nylon covering; single winding, 2 pie universal wound; tapped at 32 turns; unshielded; ceramic form w/powdered iron core; coil $\frac{1}{2}''$ lg × $1\frac{1}{4}''$ dia; coil form $1\frac{13}{16}''$ lg × 1″ dia; adjustable iron core tuning w/screwdriver adjustment located on top of coil form; 3 solder lug term, located one on bottom, 2 on top end of coil form; one $\frac{1}{4}''$-32 thrd mtg bushing, $\frac{11}{16}''$ lg through bottom of coil form											
L-121	Coil, RF: 24 turns #14 AWG silver plated copper conductor; single winding, single layer wound, untapped, unshielded; ceramic form w/air core; coil $2\frac{61}{64}''$ lg × $1\frac{5}{32}''$ OD; $6\frac{1}{4}''$ lg min × $3\frac{3}{4}''$ wd × $3\frac{5}{16}''$ h excl extension shaft; sliding roller contact tuning w/extension shaft adjustment, shaft mtd in center of coil form, contact mtd along upper rim of coil; 8 stud type term, located 4 at each end, on ceramic mtg plate; 2 ceramic mtg plates, supported by four $6\frac{1}{4}''$ lg, $\frac{1}{8}''$-32 thrd stud bolts on 3.187″ × 2.695″ mtg/c, attached to 2 mtg brackets at base of plates by the 2 lower supporting stud bolts	Output Level control			738	P606-1	L-121	1				
L-122	Reactor: filter choke; 1 section; 8 henries inductance; 125 ohms DC resistance; 250 ma DC current rating; 2500 VDC test voltage; hermetically sealed metal case; 5.062″ lg × 3.500″ wd × 5.125″ h, excl term; mts by four 0.218″ dia mtg holes on 4.562″ × 2.250″ mtg/c; 2 stud type term located on bottom of case	Filter choke	(-302510)	N16-R-29190 -2218	332	H391-1	L-122, L-123	2	1	1	1	1
L-123	Same as L-122	Filter choke										
L-124	Reactor: RF filter choke; 1 section; 0.6 mh, no DC rating; 0.5 ohms DC resistance; 1000 V rms test voltage; $1\frac{31}{32}''$ lg excl tuning slug × $1\frac{7}{16}''$ diam; two #4-40 tapped mtg holes on 0.427″ diam circle of brass nickel plated plug held to coil form thru three #40-40 tapped mtg holes $\frac{5}{32}''$ dp set 120° apart; 2 solder lug term, located one on each end of coil form; sprayed w/moisture and fungus resistant lacquer	A.C. line filter			1; SA:8892	SA:8892	L-124, L-125	2	1	1	1	1

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
INDUCTORS (continued)												
L-125	Same as L-124	A.C. line filter										
METERS												
M-101	Ammeter: panel mtd; D.C.; 0 to 1 CW, milliampere scale, graduated in increments of 0.02; black phenolic, round case, style no 15, MBCA ref dwg group 27; 2.695″ diam, flange; 2.21″ diam × 1.6″ d body; ±2% accuracy at full scale reading; 150 mv drop across terminals; mtd on non-magnetic panel; not magnetically shielded; black scale markings on white background; self-contained unit; three 0.125″ diam mtg holes on 1.22″ radius, spaced 120° apart; 2 stud type #10-32 NC-2 free fit, 0.69″ lg terminals; JAN-I-6 spec	Meter	MR25W001DCMA	N17-M-19255-1051	188	M800-6	M-101	1				
M-102	Thermometer: general observation type; bimetal thermal element; 0° to 100° C; tube 0.140″ diam × 8″ lg; general use; 18-8 stainless steel; 1.73″ OD × 8.272″ lg; panel mtd w/2.375″ diam o/a bezel having three 0.125″ diam mtg holes spaced 120° apart on 1.046″ radius	Oven thermometer	(-40223)	N18-T-3095-110	188	P607-1	M-102	1				
NAMEPLATES												
N-101	Dial, scale: output level control; 0 to 24 scale markings, counter-clockwise; graduated in increments of 1; 360° arc; round shape, 3″ diam; center mtg hole 0.406″ diam × 0.313″ across flats; aluminum w/gray enamel finish; black characters on gray background	Output Level control dial scale		‡	1; Q673-1	Q673-1	N-101	1				
N-102	Chart: tuning; 0.010″ index board 3⅞″ lg × 2$\frac{15}{16}$″ wd; black print on white background; four 0.128″ dia mtg holes on 3⅝″ × 2$\frac{11}{16}$″ mtg/c; semi-gloss finish	Tuning chart		‡	506	Q683-1	N-102	1				

MECHANICAL PARTS

O-101	Retainer, electron tube: type 302 stainless steel; 1 clip type fastening device; 1¼″ ID × $\frac{17}{32}''$ h; mtd by mtg bracket w/1 hole for #6-32 screw located 60 deg from tension loop, 115 deg from hinge on $\frac{27}{32}''$ radius; designed to hold mat'l of 1¼″ max dia	V-101 clamp		N16-C-300442-625	296	F-892-7	O-101, O-102, O-103, O-104, O-105, O-106, O-107, O-108, O-109	9				
O-102	Same as O-101	V-102 clamp										
O-103	Same as O-101	V-104 clamp										
O-104	Same as O-101	V-105 clamp										
O-105	Same as O-101	V-107 clamp										
O-106	Same as O-101	V-108 clamp										
O-107	Same as O-101	V-109 clamp										
O-108	Same as O-101	V-110 clamp										
O-109	Same as O-101	V-111 clamp										
O-110	Retainer, electron tube: type 302 stainless steel; 1 clip type fastening device; 1⅜″ ID × ¾″ h; mtd by mtg bracket w/1 hole for #6-32 screw located 60 deg from tension loop, 120 deg from hinge on $\frac{29}{32}''$ radius; designed to hold mat'l of 1⅜″ max dia	V-112 clamp		N16-C-300798-866	296	F892-2	O-110,O-134	2				
O-111	Retainer, electron tube: type 302 stainless steel; 1 clip type fastening device; $1\frac{5}{32}''$ ID × ¾″ h; mtd by mtg bracket w/1 hole for #6-32 screw located 65 deg from tension loop, 100 deg from hinge on $\frac{51}{64}''$ radius; designed to hold mat'l of $1\frac{5}{32}''$ max dia	V-113 clamp		N16-C-300798-452	296	F892-3	O-111, O-112, O-113	3				
O-112	Same as O-111	V-114 clamp										
O-113	Same as O-111	V-115 clamp										
O-114	Retainer, electron tube: type 302 stainless steel; 1 clip type fastening device; 1¼″ ID × ¾″ h; mtd by mtg bracket w/1 hole for #6-32 screw, located 60 deg from tension loop, 115 deg from hinge, on $\frac{27}{32}''$ radius; designed to hold material 1¼″ max dia	V-103 clamp		N16-C-300798-621	296	F892-1	O-114, O-115, O-116	3				
O-115	Same as O-114	V-106 clamp										

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				MECHANICAL PARTS (continued)								
O-116	Same as O-114	R-203 clamp										
O-117	Detent, switch: provisions for 3 switch positions; non-adjustable stops; $1\frac{11}{16}''$ lg × $1\frac{33}{64}''$ wd × $1\frac{7}{8}''$ h; mts by $\frac{3}{8}''$ lg, $\frac{3}{8}''$-32 bushing w/non-turn device located $\frac{17}{32}''$ from center at 9 o'clock	Freq Range sw detent			111	L636-1	O-117	1				
O-118	Bushing: bearing for extension shaft support; leaded brass, nickel plated; male; $\frac{1}{2}''$ across flats of hex end × $\frac{35}{64}''$ lg × 0.252″ ID, w/$\frac{3}{64}''$ shoulder and 0.435″-27 thread	Tuning control shaft bushing		‡	1; B713-34	B713-34	O-118, O-203	2				
O-119	Mounting: aluminum; caustic etch finish w/water dip lacquer; mts air inductor by four 0.156″ dia mtg holes on mtg ctrs of: 3.187″, 1.125″ and 1.875″; mts to chassis w/three 0.156″ dia mtg holes on irregularly spaced mtg/c; "L" shaped, $3\frac{13}{16}''$ lg × $2\frac{3}{4}''$ h × 0.091″ thk; for mtg air inductor	L-121 mtg		N16-M-61518 -6457‡	1; P630-1	P630-1	O-119	1				
O-120	Shaft: rotary switch extension shaft; cadmium plated brass; round w/2 flatted faces; $9\frac{1}{4}''$ lg × 0.248″ dia × 0.185″ across flats	Freq Range sw ext shaft		N16-S-21048 -7974‡	1; M979-14	M979-14	O-120	1				
O-121	Shaft: rotary switch extension; cadmium plated brass; round w/2 flatted faces; 3″ lg × 0.248″ dia × 0.185″ across flats	Freq Range sw ext shaft		N16-S-20980 -3492‡	1; M979-16	M979-16	O-121	1				
O-122	Coupling, flexible: tuning shaft coupling; assembly consists of 2 hubs and disc assemblies, separated by $\frac{1}{4}''$ grade L-4 ceramic insulator, w/four $\frac{5}{16}''$ diam brass spacers; brass hub, phosphor bronze disc, nickel plated; $1\frac{3}{8}''$ dia × $1\frac{1}{8}''$ lg o/a; hubs bored for 0.250″ dia shaft and mtd by four #8-32 allen-head set screws	Output Level control shaft coupling			1; SA:8887-2	SA:8887-2	O-122, O-124, O-125, O-126	4				

O-123	Coupling, flexible: tuning shaft coupling; assembly consists of 2 hubs and disc assemblies, separated by $\frac{1}{4}''$ grade L-4 ceramic insulator, w/four $\frac{5}{16}''$ diam brass spacers; brass hub, phosphor bronze disc, nickel plated; $1\frac{3}{8}''$ dia × $1\frac{1}{4}''$ lg o/a; hubs bored for 0.250″ dia shaft and mtd by four #8-32 allen-head set screws	Output Level control shaft coupling		(For replacement use O-122 by reversing hubs)	1; SA:8887-1	SA:8887-1	O-123	1				
O-124	Same as O-122	Tuning control shaft coupling										
O-125	Same as O-122	Output Tuning control shaft coupling										
O-126	Same as O-122	Freq Range sw shaft coupling										
O-127	Coupling, flexible: tuning shaft coupling; assembly consists of 2 hubs and spiders w/1 disc, riveted together; brass; $1\frac{1}{16}''$ dia × 0.541″ lg o/a; hubs bored for 0.250″ dia shaft and mtd by four #8-32 allen set screws	Freq Range sw ext shaft coupling			1; SA:8774	SA:8774	O-127	1				
O-128	Bezel: brass w/black enamel finish; 2.375″ OD × 1.531″ ID × 0.312″ h; three 0.125″ dia mtg holes on 1.046″ radius spaced 120° apart	Thermometer mtg		‡	1; P626-1	P626-1	O-128	1				
O-129	Gasket: shock mtg; neoprene; single hole; round, 1.750″ OD × 1.531″ ID × $\frac{3}{32}''$ thk	Thermometer gasket		N17-G-161530-484‡	1366	P627-1	O-129	1				
O-130	Clamp, electrical: aluminum w/caustic etch and water dip lacquer finish; two #6-32 spadebolt fasteners; $1\frac{9}{16}''$ lg × $\frac{49}{64}''$ max wd × $1\frac{15}{16}''$ h; mtd by two #6-32 spadebolts w/thrd $\frac{1}{2}''$ min lg on $1\frac{9}{16}''$ mtg/c; JAN-C-25 spec	C-102 mtg	CPO6SA4	N16-M-60958-3591	14	L896-1	O-130, O-131	2				
O-131	Same as O-130	C-106 mtg										
O-132	Clamp, electrical: aluminum w/caustic etch and water dip lacquer finish; two #6-32 spadebolts fasteners; $1\frac{9}{16}''$ lg × $\frac{49}{64}''$ max wd × $2\frac{11}{16}''$ h; mtd by two #6-32 spadebolts w/thrd $\frac{1}{2}''$ min lg on $1\frac{9}{16}''$ mtg/c; JAN-C-25 spec	C-103 mtg	CPO6SA6	N16-M-60906-8018	14	L896-3	O-132, O-133	2				
O-133	Same as O-132	C-104 mtg										
O-134	Same as O-110	V-116 clamp										

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				MECHANICAL PARTS (continued)								
O-135	Clamp, electrical: aluminum w/caustic etch and water dip lacquer finish; two #6-32 spade-bolt fasteners; $1\frac{9}{16}$'' lg × $\frac{49}{64}$'' wd × $1\frac{5}{16}$'' h; mtd by two #6-32 spade-bolts w/thrd ½'' min lg on $1\frac{9}{16}$'' mtg/c; JAN-C-25 spec	C-118 mtg	CPO6SA2	N16-M-60958 -3571	14	L896-5	O-135	1				
O-136	Plate, bearing: outer bearing; cadmium plated brass; rectangular shape; w/top end rounded; 1½'' h × $\frac{5}{8}$'' wd × $\frac{15}{64}$'' thk; two $\frac{5}{32}$'' × $\frac{7}{32}$'' mtg slots on ½'' mtg/c; supports a ½'' dia brass bearing w/0.251'' dia shaft hole	Output Level control shaft bearing		‡	1; SA:8755	SA:8755	O-136	1				
O-137	Retainer, crystal holder: brass; dull nickel finish; designed to retain crystal socket and clamp; 1.155'' lg × ½'' wd × $\frac{5}{16}$'' h; mtd by one 0.125'' dia hole; used as crystal socket base plate; part of E-119	XY-101 retainer		N16-R-501081 -117‡	1316	K689-1	O-137, O-138, O-139	3				
O-138	Same as O-137; part of E-119	XY-102 retainer										
O-139	Same as O-137; part of E-119	XY-103 retainer										
O-140	Clamp, electrical: brass dull nickel finish; pressure type fastener; 1¼'' lg × 0.937'' h × 0.050'' thk; mts in 0.052'' dia hole 1.093'' apart; designed to hold crystal 0.937'' h max; part of E-119	Y-101 clamp		N17-C-805751 -551‡	1; K690-1	K690-1	O-140, O-141, O-142	3				
O-141	Same as O-140; part of E-119	Y-102 clamp										
O-142	Same as O-140; part of E-119	Y-103 clamp										
O-143	Nut, plain knurled: brass w/dull nickel finish; knurled thumb drive w/30 TPI straight knurl; #10-32 NFT class 2 fit; 1'' OD × 0.781'' h; part of E-101 or E-122	Blister mtg nuts		‡	665	P648-1	O-143	4				
O-144	Screw, captive: knurled thumb drive w/screwdriver slot on head;	Front panel mtg screws			665	L610-1	O-144	12	1	2	1	2

O-144 (cont)	knurled thumb head; steel w/black nickel finish; #12-24 NC-2 thrd; $1\frac{1}{16}''$ lg o/a, $\frac{1}{4}''$ lg thrd, $\frac{5}{8}''$ dia head; $\frac{5}{8}''$ dia × $\frac{5}{16}''$ lg shoulder											
O-145	Grommet: rubber; fits $\frac{7}{16}''$ hole; $\frac{5}{16}''$ ID × $\frac{1}{16}''$ groove width, $\frac{9}{32}''$ o/a width × $\frac{5}{8}''$ OD	L-121 shock mts		‡	187	E923-11	O-145	3				
O-146	Plate, back: oven door plate backing; black masonite; 4″ lg × 2″ wd × $\frac{1}{8}''$ thk; four 0.156″ dia mtg holes on $2\frac{1}{4}''$ × $1\frac{1}{4}''$ mtg/c	Oven door plate backing		‡	68	Q659-1	O-146	1				
O-147	Seal: door seal; sponge rubber; $4\frac{9}{16}''$ lg × $2\frac{1}{2}''$ wd × $\frac{3}{8}''$ thk; four $\frac{1}{4}''$ dia (approx) mtg holes on $2\frac{1}{4}''$ × $\frac{1}{4}''$ mtg/c	Oven door rubber seal		‡	1366	P636-1	O-147	1				
O-148*	Mounting: steel; gray enamel finish; holds 4 shock mts by means of bolts thru $\frac{13}{32}''$ dia holes on $15\frac{1}{2}''$ × 14″ mtg/c; sixteen 0.257″ mtg holes, four at each corner of plate, on $3\frac{3}{8}''$ × $2\frac{3}{8}''$ mtg/c; 14″ dia center hole cut out of plate; part of A-104	Mtg plate for casters		‡	238	P691-1	O-148	1				
O-149†	Clamp, electrical: aluminum alloy; sand blast w/clear lacquer finish; 2 bolt type pressure fastening device; $1\frac{5}{64}''$ lg × $1\frac{5}{16}''$ OD; mts by $\frac{3}{4}''$-20 female thrd; designed to hold $\frac{1}{2}''$ dia cable; part of A-105	P-109 thru P-112 cable clamp	AN 3057-6	N17-C-781366 -251	339	Q675-2	O-149	4				
O-150†	Ring, bonding: bonding ring for AN shell size 14 and 14S; tinned copper;round;0.682″OD × 0.557″ ID; part of A-105	Bonding ring		N17-R-650211 -112	339	P145-3	O-150	4				
O-151 thru O-153	Not used											
O-154	Shaft: extension shaft; cadmium plated steel; $8\frac{1}{16}''$ lg × 0.250″ dia	Output Level control ext shaft		‡	1; D644-4	D644-4	O-154	1				
O-155	Shaft: extension shaft; cadmium plated steel; $14\frac{1}{8}''$ lg × 0.250″ dia	Output Tuning control ext shaft		‡	1; D644-5	D644-5	O-155	1				
O-156	Shaft: extension shaft; cadmium plated steel; 2″ lg × 0.250″ dia	Tuning control ext shaft		‡	1; D644-6	D644-6	O-156	1				
O-157	Arm: latching arm; type 302 stainless steel; $4\frac{5}{8}''$ lg × $\frac{9}{32}''$ wd × 1″ h; one 0.312″ dia mtg hole; right hand latch arm	Chassis release latch (right side)			512	Q474-1	O-157	2				

* Used on KY-58/GRT only
† Used on KY-75/SRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
MECHANICAL PARTS (continued)												
O-158	Arm: latching arm; type 302 stainless steel; $4\frac{5}{8}$" lg × $\frac{9}{32}$" wd × 1" h; one 0.312" dia mtg hole; left hand latch arm	Chassis release latch (left side)			512	Q474-2	O-158	2				
O-159	Spring: torsion type; for latching arm; 0.048" dia music wire, nickel plated; $1\frac{1}{8}$" lg × $1\frac{1}{8}$" wd × 0.048" thk; right hand turns; plain straight ends; $\frac{1}{2}$" mtg hole	Chassis release latch tension spring (right side)			1; Q477-4	Q477-4	O-159	2	1	1	1	1
O-160	Spring: torsion type; for latching arm; 0.048" dia music wire, nickel plated; $1\frac{1}{8}$" lg × $1\frac{1}{8}$" wd × 0.096" thk; left hand turns; plain straight ends; $\frac{1}{2}$" mtg hole	Chassis release latch tension spring (left side)			1; Q477-3	Q477-3	O-160	2	1	1	1	1
O-161	Ring, retainer: cadmium plated beryllium copper; circular; 0.312" OD × 0.028" wd × 0.281" ID; part of E-101 or E-122	Retaining rings			289	H602-10	O-161	8				
O-162	Handle: front panel; aluminum w/black alumite finish; $4\frac{3}{8}$" lg × $1\frac{7}{8}$" h × $\frac{3}{8}$" dia; two #12-24 tapped mtg holes on 4" mtg/c	Front panel handles		N16-H-150001 -289‡	298	P656-1	O-162	4				
O-163	Bushing: bearing for drive shaft; steel; male; $\frac{3}{4}$" across flats of hex end × 0.531" lg × 0.437" ID × 0.624" OD	Output Level control shaft bushing		‡	1; Q672-1	Q672-1	O-163	1				
O-164	Bearing: bearing for gear drive; cadmium plated brass; $\frac{11}{16}$" lg × $\frac{3}{8}$" across flats of hex × 0.249" OD; one #8-32 tapped hole at hex end, $\frac{1}{4}$" d	O-198 bearing		‡	344	Q668-1	O-164	1				
O-165	Ring, retainer: cadmium plated beryllium copper; circular; 0.250" OD × 0.028" wd × 0.225" ID	Retaining ring			289	H602-7	O-165	5				
O-166	Shaft: latching shaft; cadmium plated steel; $\frac{3}{4}$" lg × $\frac{7}{16}$" OD; single #6-32 tapped hole $\frac{5}{16}$" d	Control access door latch shaft		‡	344	P647-1	O-166	1				
O-167	Washer, spring tension: round, U bend type; phosphor bronze; cad-	Control access door latch washer		‡	30	J728-9	O-167	1				

O-167 (cont)	mium plated; center hole $\frac{5}{16}$″ dia × $\frac{1}{2}$″ OD × 0.005″ wd × $\frac{3}{32}$″ o/a h											
O-168	Latch: door latch; cadmium plated brass; circular; $\frac{3}{4}$″ OD × $\frac{1}{16}$″ wd; single mtg hole $\frac{1}{4}$″ dia × $\frac{3}{16}$″ wd across flats	Control access door latch		‡	1; P646-1	P646-1	O-168	1				
O-169	Nut, round: round cap nut; stainless steel; #10-32 inside thread; 0.281″ lg × $\frac{9}{16}$″ OD	Chassis release latch pivot		‡	1372	Q475-1	O-169	4				
O-170	Not used											
O-171	Not used											
O-172	Not used											
O-173	Hinge: butt type; cadmium plated wrought steel; $2\frac{1}{2}$″ lg × $1\frac{11}{16}$″ wd; non-removable type pin; four $\frac{5}{32}$″ dia mtg holes on $1\frac{3}{4}$″ × $1\frac{3}{16}$″ mtg/c	Control access door hinge		N16-H-500001 -131‡	1; L551-2	L551-2	O-173	1				
O-174	Spring: flat type; for door hinge; 0.032″ cadmium plated phosphor bronze; $2\frac{3}{8}$″ lg × $1\frac{1}{8}$″ wd × 0.32″ thk; two $\frac{5}{32}$″ dia mtg holes on $1\frac{3}{4}$″ mtg/c; T-shaped	Control access door spring		‡	1; L615-1	L615-1	O-174	1				
O-175	Board: for writing surface; fixed type; black masonite; plain; $18\frac{7}{16}$″ lg × $15\frac{3}{16}$″ wd × $\frac{1}{8}$″ thk; rectangular shape	Cabinet top		‡	158	P699-1	O-175	1				
O-176*	Mount, vibration: cadmium plated steel; holds cabinet by center hole 1″ lg × 0.391″ dia; four 0.257″ dia mtg holes on $2\frac{1}{2}$″ × $2\frac{1}{2}$″ mtg/c; 45 lb. load, 3″ sq × $1\frac{1}{2}$″ h; for mtg Frequency Shift Keyer cabinet; part of A-104	Cabinet shock mts		N17-M-75215 -9751	125	P682-1	O-176	4				
O-177*	Caster: olive drab painted steel; $4\frac{1}{8}$″ lg × $3\frac{1}{8}$″ wd × $3\frac{15}{16}$″ h; four $\frac{5}{16}$″ dia mtg holes on $3\frac{3}{8}$″ × $2\frac{3}{8}$″ mtg/c; part of A-104	Cabinet casters			1367	P690-I	O-177	4				
O-178	Mounting: cadmium plated steel; holds item by means of #8-32 screw; single 0.170″ dia mtg hole; shock mts over rubber grommet; $\frac{9}{16}$″ dia × $\frac{1}{8}$″ max h; for mtg bracket	L-121 shock mts		N16-B-750001 -523	8	H888-3	O-178	6				
O-179	Spring: flat type; for grounding contact; 0.020″ phosphor bronze; $1\frac{23}{32}$″ lg × $\frac{1}{8}$″ wd × $\frac{5}{16}$″ h; straight flat ends	Freq Range control shaft grounding spring		‡	24	K451-1	O-179	1				

* Supplied on KY-58/GRT only.
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
MECHANICAL PARTS (continued)												
O-180	Nut, round: round cap nut; stainless steel; #6-32 inside thread; 0.281″ lg × 0.375″ OD	Chassis release latch stop		‡	1372	Q476-1	O-180	4				
O-181	Asbestos: sheet form; for heat insulation; $6\frac{1}{8}''$ lg × $5\frac{5}{8}''$ wd × $\frac{1}{4}''$ thk; high temperature application, maintained at a constant 70°C; a $\frac{1}{2}''$ lg × $\frac{3}{8}''$ wd notch at one corner; part of E-119	Right side oven insulation		‡	1; P661-1	P661-1	O-181	1				
O-182	Asbestos: sheet form; for heat insulation; $6\frac{1}{8}''$ lg × $5\frac{5}{8}''$ wd × $\frac{1}{4}''$ thk; high temperature application; maintained at a constant 70°C; part of E-119	Left side oven insulation		‡	1; P661-2	P661-2	O-182	1				
O-183	Asbestos: sheet form; for heat insulation; $6\frac{1}{8}''$ lg × $6\frac{5}{16}''$ wd × $\frac{1}{4}''$ thk; high temperature application maintained at a constant 70°C; part of E-119	Top side oven insulation		‡	1; P662-1	P662-1	O-183, O-184	2				
O-184	Same as O-183	Bottom side of oven insulation										
O-185	Asbestos: sheet form; for heat insulation; $6\frac{5}{16}''$ lg × $6\frac{1}{8}''$ wd × $\frac{5}{8}''$ thk; high temp application, maintained at a constant 70°C; part of E-119	Back side of oven insulation		‡	1; P663-1	P663-1	O-185	1				
O-186	Clamp, electrical: aluminum alloy; sand blast w/clear lacquer finish; 1 screw type fastening device; 1″ lg × $1\frac{1}{8}''$ dia; mts by $\frac{7}{8}''$ 20 inside thd; $\frac{3}{8}''$ lg; designed to hold cable $\frac{9}{16}''$ dia; used as cable clamp; part of E-101 or E-122	Interconnecting cable clamps		N17-C-781444-504	128	P640-2	O-186	2				
O-187	Clamp, electrical: aluminum alloy; sand blast w/clear lacquer finish; 1 screw type fastening device; $1\frac{7}{64}''$ lg × $1\frac{17}{64}''$ dia; mts by 1″-20 inside thrd, $\frac{3}{8}''$ lg; designed to hold cable $\frac{5}{8}''$ dia; used as cable clamp; part of E-101 or E-122	Interconnecting cable clamps	AN 3057-10		128	P640-1	O-187	2				

O-188	Bushing: reducing fitting for cable; aluminum alloy; male; $\frac{7}{8}''$ lg × $1\frac{1}{4}''$ across hex end flats × 0.604″ ID × $\frac{3}{16}''$ across shoulder; part of E-101 or E-122	Interconnecting cable feedthru	AN 3064-10		128	P641-2	O-188	2				
O-189	Bushing: reducing fitting for cable; aluminum alloy; male; $\frac{7}{8}''$ lg × $1\frac{1}{16}''$ across hex end flats × 0.473″ ID × $\frac{3}{16}''$ across shoulder; part of E-101 or E-122	Interconnecting cable feedthru	AN 3064-8		128	P641-1	O-189	2				
O-190	Bushing: reducing fitting for mtg screws; cadmium plated steel; 0.187″ lg × $\frac{3}{8}''$ OD × 0.140″ ID × 0.078″ across shoulder; part of E-101 or E-122	J-105, J-106 mtg hole bushings		‡	1373	P638-1	O-190	8				
O-191	Not used											
O-192	Latch, fastener: door latch; cadmium plated brass; circular beveled washer attached to round shaft w/flatted end; $\frac{57}{64}''$ lg × $1\frac{5}{16}''$ OD	Oven door latch		‡	1; SA:7308	SA:7308	O-192	1				
O-193†	Mounting: metal parts—steel, rubber parts—natural rubber; cadmium plated finish; holds cabinet by means of bolt thru a center $\frac{5}{8}''$-11 tapped hole $\frac{7}{8}''$ d; two $\frac{17}{32}''$ diam mtg holes on vertical center line spaced 6″ c to c; 4 shock mts attached to base of cabinet; for mtg Frequency Shift Keyer cabinet; part of A-105	Cabinet shock mts			1370	L631-1	O-193	4				
O-194	Ring, retainer: cadmium plated steel; for $\frac{1}{4}''$ dia shaft; 0.260″ ID open, 0.187″ ID closed, 0.031″ wd	Oven door latch retaining ring			97	P491-3	O-194	1				
O-195	Hinge: butt type; cadmium plated steel; $3\frac{1}{4}''$ lg × $1\frac{5}{32}''$ wd × $\frac{9}{32}''$ d; nonremovable type pin; two 0.156″ dia mtg holes and two #6-32 tapped mtg holes on 2.250″ mtg/c	Oven door hinge		‡	1; P652-2	P652-2	O-195	1				
O-196	Nut, plain knurled: dull nickel plated; brass finish; $\frac{5}{8}''$ round knurled drive; $\frac{15}{32}''$-32, NFT, class 2 fit; $\frac{5}{8}''$ OD × $\frac{3}{16}''$ h	Power sw and Plate sw panel mtg nuts			1; J703-3	J703-3	O-196	2				
O-197†	Washer, flat: rd; cadmium plated steel; $\frac{21}{32}''$ diam center hole; outside $2\frac{1}{2}''$ diam × $2\frac{1}{4}''$ lg × $\frac{1}{4}''$ thk; for $\frac{5}{8}''$-11 bolt size; part of A-105	O-193 shock pads			238	L620-1	O-197	4				

† Supplied on KY-75/SRT only.
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
MECHANICAL PARTS (continued)												
O-198	Gear assembly: for gear driving; cadmium plated brass; $2\frac{9}{16}$'' OD × $\frac{19}{64}$'' thk w/0.250'' dia bore; hub gear $\frac{9}{16}$'' OD; mts on stud bearing 0.249'' dia w/washer and retaining ring; spur type gear w/std involute tooth form having 80 teeth w/32 pitch and 2.5 pitch dia, hub gear has 16 teeth w/32 pitch and $\frac{1}{2}$ pitch dia	O-199 driving gear			1; SA:8763	SA:8763	O-198	1				
O-199	Gear assembly: for dial driving; cadmium plated brass; $2\frac{9}{16}$'' OD × $\frac{51}{64}$'' thk w/0.250'' dia bore; hub bushing 0.435'' OD × $\frac{51}{64}$'' lg; bushing mts on shaft 0.249'' dia, gear rolled and soldered on bushing; spur type gear w/std involute tooth form having 80 teeth w/32 pitch and 2.5 pitch dia	Output Level control dial drive gear			1; SA:8764	SA:8764	O-199	1				
O-200	Pinion, gear: spur type; cadmium plated brass; for gear and shaft driving; AGMA std involute tooth form; 16 teeth, 32 pitch, $\frac{1}{2}$ pitch dia; $3\frac{1}{2}$'' lg × $\frac{9}{16}$'' OD; hub $3\frac{1}{2}$'' lg × 0.249'' dia	Output Level control driving gear			1; SA:8765	SA:8765	O-200	1				
O-201	Drive, tuning: steel disc w/satin polish finish, brass bearing, handle and stud w/black nickel finish; $2\frac{3}{8}$'' OD × $1\frac{21}{64}$'' lg incl handle; single axial mtg hole 0.250'' dia w/two #8-32 tapped mtg holes set 90 deg apart on bearing	Output Level control drive			1; SA:8767	SA:8767	O-201	1				
O-202	Dial, locking clamp: brass; dull nickel finish; 1 spring clamp fastening device; $\frac{61}{64}$'' lg × $\frac{61}{64}$'' wd × $\frac{19}{32}$'' h; two $\frac{9}{64}$'' dia mtg holes on $\frac{5}{8}$'' mtg/c; designed to hold disc $\frac{1}{16}$'' max thk	C-114, C-127, C-150, L-121, R-143 dial locks			1; SA:5810	SA:5810	O-202	5				
O-203	Same as O-118	Output Tuning control shaft bushing										

PLUGS

P-101	Connector, plug: 20 round male contacts; straight type; $3\frac{3}{8}$″ lg × $1\frac{5}{8}$″ wd × $1\frac{11}{16}$″ h; 8 amp, 250 v; aluminum alloy rectangular shaped body w/tin plate and clear lacquer finish; melamine "G" insert; four 0.144″ diam mtg holes, $\frac{5}{32}$″ lg on 1″ × 2.875″ mtg/c; connectors and associated hardware silver plated; $\frac{1}{16}$″ raised characters; same as P-102 less coaxial connectors	multiconnector plug for MD-165/URT		(For replacement use P-102 by removing coaxial connectors)	339	P644-2	P-101	1				
P-102	Connector, plug: 20 round straight type male contacts and 3 rt angle type coaxial female contacts; $3\frac{3}{8}$″ lg × $1\frac{5}{8}$″ wd × $1\frac{11}{16}$″ h; 8 amps, 250 v; aluminum alloy rectangular shaped body w/tin plate and clear lacquer finish; melamine "G" insert; four 0.144″ diam mtg holes, $\frac{5}{32}$″ lg, on 1″ × 2.875″ mtg/c; coax and solid connectors, and associated hardware silver plated; $\frac{1}{16}$″ raised characters; adapter bushing furnished to accommodate RG-59/U cable in each coaxial fitting	multiconnector plug for AM-165/URT			339	P644-3	P-102	1	1	1	1	1
P-103† thru P-108	Connector, plug: 1 rd male contact; straight type; $1\frac{3}{16}$″ dia × $1\frac{9}{16}$″ lg approx; cylindrical brass body silver plated; mica-filled bakelite insert; cable opening for 0.410″ dia cable; multiple piece construction, tapered removable back shell which provides extra cable grip in single mtg hole; mts by $\frac{3}{8}$″-24 threaded body; P-103 & P-104 part of W-108, P-105 & P-106 part of W-107, P-107 & P-108 part of W-106	J-109, J-110, J-111 connectors	PL-259A (-49195)	N17-C-71413 -4752	262	F505-1	P-103 thru P-108	6				
P-109†	Connector, plug: 3 rd female contacts; polarized; straight type; $1\frac{11}{16}$″ lg × $1\frac{1}{16}$″ dia; aluminum cylindrical body, sand blasted w/clear lacquer finish; locking type w/split shell; molded phenolic insert; $\frac{1}{2}$″ dia max cable opening; multiple piece construction w/single mtg hole, $\frac{1}{2}$″ dia, for cable; body mtd by $\frac{3}{4}$″-20 conduit thd, $\frac{3}{8}$″ lg; $1\frac{1}{16}$″ OD coupling nut w/$\frac{7}{8}$″-20 thd; part of W-102	Audio Freq meter connector	AN 3106B-14S-1S	N17-C-70328 -1332	339	Q676-1	P-109, P-111	2				
P-110†	Connector, plug: 3 rd male contacts; polarized; straight type;	Audio Freq meter connector	AN 3106B-14S-1P	N17-C-70588 -1327	339	Q677-1	P-110, P-112	2				

† Supplied on KY-75/SRT only

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
PLUGS (continued)												
P-110 (cont)	$1\frac{11}{16}''$ lg × $1\frac{1}{16}''$ dia; aluminum cylindrical body sand blast w/clear lacquer finish; locking type w/split shell; molded phenolic insert; $\frac{1}{2}''$ dia max cable opening; multiple piece construction w/single mtg hole, $\frac{1}{2}''$ dia, for cable; body mtd by $\frac{3}{4}''$-20 conduit thrd, $\frac{3}{8}''$ lg; $1\frac{1}{16}''$ OD coupling nut w/$\frac{7}{8}''$-20 thd; part of W-102											
P-111†	Same as P-109; part of W-101	Keyline connector										
P-112†	Same as P-110; part of W-101	Keyline connector										
P-113†	Connector, plug: 3 flat female contacts; polarized; straight; 1.968″ lg × $1\frac{1}{2}''$ dia; 10/15 amp, 250/125 v electrical rating; rd bakelite body; 0.625″ dia max cable opening; single mtg hole w/cable clamp 0.468″ lg; part of W-103	AC Power connector			93; 7559G	Q678-1	P-113	1				
P-114†	Connector, plug: 3 concave male contacts; polarized; angle type w/90° angle; $1\frac{15}{32}''$ lg excl contacts × 2″ OD; 10/20 amp, 575/250 v electrical rating; cylindrical metal body, plated to resist corrosion, locking type; molded black bakelite insert; 0.750″ dia max cable opening; single mtg hole 0.750″ dia max, w/cable clamp, $\frac{21}{32}''$ lg; part of W-103	AC Power connector			93; 7311G	Q679-1	P-114	1				
RESISTORS												
R-101	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 100,000 ohms, ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	J-101 terminating	RC30BF104K (-63288-104)	N16-R-50634 -0231	63	H370-28	R-101, R-120, R-142, R-178, R-184, R-195	6				

R-102	Resistor, variable: wire wnd; 1 section; 750 ohms ±10%; 2 watt nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed metal case 1.28″ diam max × 0.62″ d max; round, metal shaft, ¼″ diam × ⅞″ lg; high torque; insulated contact arm, no "off" position; ⅜″-32 thrd mtg bushing; ⅜″ lg; non-turn device located on 17/32″ radius at 9 o'clock; JAN-R-19 spec	Photo Input control	RA20A2RD751-AK		11	H345-18	R-102	1				
R-103	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 10,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	input metering	RC30BF103K (-63288-103)	N16-R-50283-0231	63	H370-24	R-103, R-188, R-193	3				
R-104	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 68 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	Metering switch shunt	RC30BF680K (-63288-680)	N16-R-49500-0231	273	H370-11	R-104, R-197	2				
R-105	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 3300 ohms, ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	voltage divider	RC30BF332K (-63288-332)	N16-R-50067-0231	63	H370-59	R-105	1				
R-106	Resistor, variable: wire wnd; 1 section; 3500 ohms ±10%; 2 watt nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed metal case 1.28″ diam max × 0.62″ d max; slotted metal shaft w/0.047″ wd × 0.063″ d slot in end; ¼″ diam × ½″ lg; high torque; insulated contact arm; no "off" position; ⅜″-32 thd mtg bushing, ⅜″ lg; non-turn device located on 17/32″ radius at 9 o'clock; JAN-R-19 spec	Dev Calib adj	RA20A2SA352-AK	N16-R-90933-3980	11	H345-21	R-106	1				
R-107	Resistor, fixed: composition; body style no 14 MBCA ref dwg group 2; total resistance 220 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; re-	photo filtering	RC30BF221K (-63288-221)	N16-R-49662-0231	273	H370-46	R-107	1				

† Supplied on KY-75/SRT only

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
	RESISTORS (continued)											
R-107 (cont)	sistant to humidity; 2 axial wire lead term; JAN-R-11 spec											
R-108	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 220,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-101 input filter	RC30BF224K (-63288-224)	N16-R-50715 -0231	63	H370-31	R-108, R-109, R-112, R-119, R-170	5				
R-109	Same as R-108	V-101 cathode										
R-110	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 2200 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-101 cathode	RC30BF222K (-63288-222)	N16-R-50013 -0231	63	H370-58	R-110, R-192	2				
R-111	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 6800 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-101 cathode dropping	RC30BF682K (-63288-682)	N16-R-50202 -0231	63	H370-60	R-111	1				
R-112	Same as R-108	V-101 to V-102 coupling										
R-113	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 4700 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-102 cathode dropping	RC30BF472K (-63288-472)	N16-R-50130 -0231	63	H370-49	R-113	1				
R-114	Resistor, variable: wire wnd; 1 section; 5000 ohms ±10%; 2 watt nominal power rating; std A taper	FSK Mark adj	RA20A2SA502-AK	N16-R-91031 -1135	11	H345-20	R-114	1				

R-114 (cont)	MBCA ref dwg group 3; 3 solder lug term; enclosed metal case; 1.28″ diam max × 0.62″ d max; slotted metal shaft w/0.047″ wd × 0.063″ d slot in end; ¼″ diam × ½″ lg; high torque; insulated contact arm; no "off" position; ⅜″-32 thd mtg bushing, ⅜″ lg; non-turn device located on $\frac{17}{32}$″ radius at 9 o'clock; JAN-R-19 spec												
R-115	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 470 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	Part of V-102 cathode adj network	RC30BF471K (-63288-471)	N16-R-49770-0231	63	H370-6	R-115, R-187	2					
R-116	Resistor, variable: wire wnd; 1 section; 2500 ohms ±10%; 2 watt nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed metal case; 1.28″ diam × 0.62″ d max; slotted metal shaft w/0.047″ wd × 0.063″ d slot in end; ¼″ diam × ½″ lg; high torque; insulated contact arm; no "off" position; ⅜″ lg, ⅜″-32 thrd mtg bushing; non-turn device located on $\frac{17}{32}$″ radius at 9 o'clock; JAN-R-19 spec	Photo carrier adj	RA20ASA252AK	N16-R-87419-5160	11	H345-19	R-116	1					
R-117	Resistor, variable: wire wnd; 1 section; 1000 ohms ±10%; 2 watt nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed, metal case; 1.28″ diam × 0.62″ d max; slotted metal shaft w/0.047″ wd × 0.063″ d slot in end; ¼″ diam × ½″ lg; high torque; insulated contact arm; no "off" position; ⅜″ lg, ⅜″-32 thrd mtg bushing; non-turn device located on $\frac{17}{32}$″ radius at 9 o'clock; JAN-R-19 spec	FSK carrier adj	RA20A2SA102AK	N16-R-90754-3631	11	H345-17	R-117, R-189	2					
R-118	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 680 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-102 cathode	RC30BF681K (-63288-681)	N16-R-49842-0231	63	H370-51	R-118, R-125	2					
R-119	Same as R-108	V-103 plate filter											
R-120	Same as R-101	V-103 grid											

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP, REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
RESISTORS (continued)												
R-121	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 1500 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-103 cathode	RC30BF152K (-63288-152)	N16-R-49968 -0231	63	H370-21	R-121, R-123	2				
R-122	Resistor, variable: wire wnd; 1 section; 10,000 ohms ±10%; 2 watt nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed, metal case; 1.28″ diam max × 0.62″ d max; slotted metal shaft w/0.047″ wd × 0.063″ d slot in end; 1/4″ diam × 1/2″ lg; high torque; insulated contact arm; no "off" position; 3/8″-32 thrd mtg bushing, 3/8″ lg; non-turn device located on 17/32″ radius at 9 o'clock; JAN-R-19 spec	Linearity adjustment	RA20A2SA103AK	N16-R-91291 -4930	11	L882-4	R-122	1				
R-123	Same as R-121	Part of V-103 cathode bias network										
R-124	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 22,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity; 2 axial wire lead term; JAN-R-11 spec	V-106 grid filter	RC30BF223K (-63288-223)	N16-R-50373 -0231	63	H370-7	R-124, R-166, R-179, R-180	4				
R-125	Same as R-118	V-103 cathode										
R-126	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; total resistance 4415 ohms ±1%; 1/4 watt power dissipation, 105°C max continuous oper temp; 15/32″ lg × 3/4″ OD max, excl term; lacquer coating; resistant to high humidity; 2 radial tab term, 3/8″ lg × 0.016″ min thk; chassis mtg; requires hole for #6	Part of ×4 voltage divider network	RB10B44150F		1368	P753-18	R-126, R-144	2	1	1	1	1

R-126 (cont)	screw; temp coef ±0.002%/°C; JAN-R-93 spec											
R-127	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; total resistance 4220 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max, excl term; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires holes for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of ×3 voltage divider network	RB10B42200F		1368	P753-16	R-127, R-145	2	1	1	1	1
R-128	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 3830 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of ×2 voltage divider network	RB10B38300F	N16-R-79173-5665	1368	P753-22	R-128, R-146	2	1	1	1	1
R-129	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 2660 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of ×1 voltage divider network	RB10B26600F	N16-R-79154-5459	1368	P753-20	R-129, R-147	2	1	1	1	1
R-130	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 4610 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of ×6 voltage divider network	RB10B46100F		1368	P753-12	R-130, R-148	2	1	1	1	1
R-131	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 4708 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of ×8 voltage divider network	RB10B47080F	N16-R-79193-3519	1368	P753-14	R-131, R-149	2	1	1	1	1

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				RESISTORS (continued)								
R-132	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 4740 ohms ±1%; $\frac{1}{4}$ watt power dissipation; 105°C max continuous oper temp; $\frac{15}{32}''$ lg × $\frac{3}{4}''$ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, $\frac{3}{8}''$ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X9 voltage divider network	RB10B47400F	N16-R-79193-6399	1368	P753-8	R-132, R-150	2	1	1	1	1
R-133	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 4805 ohms ±1%; $\frac{1}{4}$ watt power dissipation; 105°C max continuous oper temp; $\frac{15}{32}''$ lg × $\frac{3}{4}''$ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, $\frac{3}{8}''$ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X12 voltage divider network	RB10B48050F		1368	P753-10	R-133, R-151	2	1	1	1	1
R-134	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 764 ohms ±1%; $\frac{1}{4}$ watt power dissipation; 105°C max continuous oper temp; $\frac{15}{32}''$ lg × $\frac{3}{4}''$ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, $\frac{3}{8}''$ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X4 voltage divider network	RB10B07640F		1368	P753-19	R-134, R-152	2	1	1	1	1
R-135	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 1134 ohms ±1%; $\frac{1}{4}$ watt power dissipation; 105°C max continuous oper temp; $\frac{15}{32}''$ lg × $\frac{3}{4}''$ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, $\frac{3}{8}''$ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X3 voltage divider network	RB10B11340F		1368	P753-17	R-135, R-153	2	1	1	1	1

R-136	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 2200 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X2 voltage divider network	RB10B22000F		1368	P753-23	R-136, R-154	2	1	1	1	1
R-137	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 36,560 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X1 voltage divider network	RB10B36561F	N16-R-79321 -2251	1368	P753-21	R-137, R-155	2	1	1	1	1
R-138	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 462 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X6 voltage divider network	RB10B04620F		1368	P753-13	R-138, R-156	2	1	1	1	1
R-139	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 331 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X8 voltage divider network	RB10B03310F		1368	P753-15	R-139, R-157	2	1	1	1	1
R-140	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 290 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, ⅜″ lg × 0.016″ min thk; chassis mtg requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	Part of X9 voltage divider network	RB10B02900F	N16-R-78987 -6666	1368	P753-9	R-140, R-158	2	1	1	1	1
R-141	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 211 ohms ±1%; ¼	Part of X12 voltage divider network	RB10B02110F	N16-R-78964 -7599	1368	P753-11	R-141, R-159	2	1	1	1	1

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
RESISTORS (continued)												
R-141 (cont)	watt power dissipation; 105°C max continuous oper temp; $\frac{15}{32}$″ lg × $\frac{3}{4}$″ OD max; lacquer coating; resistant to high humidity; 2 radial tab term, $\frac{3}{8}$″ lg × 0.016″ min thk; chassis mtg requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec											
R-142	Same as R-101	V-106 grid filter										
R-143	Resistor, variable: wire wnd element; 2 sections, 2500 ohms ±1%; 6 watt nominal power dissipation; std A taper MBCA ref dwg group 3; 3 solder lug term each section; enclosed bakelite body, $2\frac{3}{8}$″ lg × 3″ diam; round bakelite shaft $\frac{3}{8}$″ diam × $\frac{3}{4}$″ lg, w/normal torque; insulated contact w/no "off" position; three #6-32 tapped mtg holes, spaced 120° apart on 1.750″ diam bolt circle; linearity of taper is ±1% of total resistance	Deviation control		N16-R-92495 -9360	1369	P624-1	R-143	1				
R-143A	Part of R-143	Part of deviation control network										
R-143B	Part of R-143	Part of deviation control network										
R-144	Same as R-126	Part of X4 voltage divider network										
R-145	Same as R-127	Part of X3 voltage divider network										
R-146	Same as R-128	Part of X2 voltage divider network										
R-147	Same as R-129	Part of X1 voltage divider network										

R-148	Same as R-130	Part of X6 voltage divider network										
R-149	Same as R-131	Part of X8 voltage divider network										
R-150	Same as R-132	Part of X9 voltage divider network										
R-151	Same as R-133	Part of X12 voltage divider network										
R-152	Same as R-134	Part of X4 voltage divider network										
R-153	Same as R-135	Part of X3 voltage divider network										
R-154	Same as R-136	Part of X2 voltage divider network										
R-155	Same as R-137	Part of X1 voltage divider network										
R-156	Same as R-138	Part of X6 voltage divider network										
R-157	Same as R-139	Part of X8 voltage divider network										
R-158	Same as R-140	Part of X9 voltage divider network										
R-159	Same as R-141	Part of X12 voltage divider network										
R-160	Not used											
R-161	Resistor, variable: wire wnd element; 1 section, 1000 ohms ±10%; 3 watts nominal power rating; std A taper MBCA ref dwg group 3; 3 solder lug term; enclosed body as per JAN-R-19; 1.28″ lg × 1.64″ dia max incl sw term; 1¼″ lg × 0.250″ dia metal shaft, flatted to 0.216″; high torque; insulated contact arm w/no "off" position; ⅜″-32 thrd bushing, 0.375″ lg, w/non-turn device located on 17⁄32″	Phase Modulation control	RA25B2FG -102AK	N16-R-90754 -3965	11	M366-2	R-161	1				

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
RESISTORS (continued)												
R-161 (cont)	radius at 9 o'clock; single-pole, single throw switch, 3 amp, 117 VAC, normally open operates at 50° rotation, 2 solder lug term; includes S-105											
R-162	Resistor, variable: composition element; 1 section, 500,000 ohms ±20%; 1/8 watt nominal power dissipation; std F taper MBCA ref dwg group 3; 3 solder lug term; enclosed case as per JAN-R-94, 31/32" diam × 29/64" thk max; round slotted metal shaft, 1/4" diam × 1/2" lg w/high torque; no shaft locking device; insulated contact arm w/o "off" position; 3/8"-32 thrd mtg bushing w/non-turn device on 7/16" radius at 9 o'clock; JAN-R-94 spec	Phase Modulation Calibration adj	RV2AYSA504F		11	M364-17	R-162, R-168	2	1	1	1	1
R-163	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 1,000,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750" lg × 0.280" diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-105 plate filter	RC30BF105K (-63288-105)	N16-R-50976 -0231	63	H370-34	R-163	1				
R-164	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 820 ohms ±5%; 1 watt power dissipation; F characteristic; 0.750" lg × 0.280" diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-105 cathode	RC30BF821J (-63288-821)	N16-R-49876 -0751	63	H370-64	R-164	1				
R-165	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 47,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750" lg × 0.280" diam max; insulated; resist-	V-105 screen dropping	RC30BF473K (-63288-473)	N16-R-50481 -0231	63	H370-3	R-165, R-177	2				

R-165 (cont)	ant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec											
R-166	Same as R-124	V-105 plate load										
R-167	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 330,000 ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	Part of V-105 phase shifting network	RC30BF334K (-63288-334)	N16-R-50760 -0231	63	H370-44	R-167, R-169	2				
R-168	Same as R-162	Part of V-105 phase shifting network										
R-169	Same as R-167	Part of V-105 phase shifting network										
R-170	Same as R-108	Part of V-105 phase shifting network										
R-171	Not used											
R-172	Resistor, fixed: wire wnd; body style no 7, MBCA ref dwg group 2; inductive wnd; 2500 ohms ±1%; ¼ watt power dissipation; 105°C max continuous oper temp; 15/32″ lg × ¾″ OD max; lacquer coating; resistant to high humidity; 2 solder lug term, ⅜″ lg × 0.016″ min thk; chassis mtg, requires hole for #6 screw; temp coef ±0.002%/°C; JAN-R-93 spec	V-106 cathode	RB10B25000F	N16-R-79298 -6139	1368	P753-7	R-172	1	1	1	1	1
R-173	Not used											
R-174	Not used											
R-175	Not used											
R-176	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 33,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-108 and V-109 screen dropping	RC30BF333K (-63288-333)	N16-R-50418 -0231	63	H370-41	R-176, R-186, R-190	3				
R-177	Same as R-165	V-107 grid bias										
R-178	Same as R-101	V-107 screen dropping										

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				RESISTORS (continued)								
R-179	Same as R-124	V-107 plate balance										
R-180	Same as R-124	V-107 plate balance										
R-181	Resistor, fixed: wire wnd; body style no 20, MBCA ref dwg group 2; inductive wnd; 4000 ohms ±5%; 12 watt power dissipation; 275°C max cont operating temp; 2″ lg × $\frac{19}{32}$″ OD; vitreous enamel coated, most resistant to salt water immersion; 2 solder lug term $\frac{5}{8}$″ lg × $\frac{21}{64}$″ wd max; requires $\frac{5}{16}$″ diam mtg hole for 2½″ lg mtg screw; JAN-R-26A spec	V-113 plate dropping	RW32F402	N16-R-66214 -5436	63	MO43-30	R-181, R-201	2				
R-182	Resistor, fixed: wire wnd; body style no 16, MBCA ref dwg group 2; non-inductive wnd; 75 ohms ±10%; 20 watt power dissipation; 340°C max cont operating temp; 3$\frac{1}{16}$″ lg × 1¼″ wd × ½″ thk; vitreous enamel coating, resistant to humidity; 2 solder lug, radial, term; ½″ lg × $\frac{3}{16}$″ wd; requires $\frac{5}{16}$″ lg × $\frac{3}{16}$″ wd mtg hole for vertical mtg bracket	J-109 terminating		N16-R-65619 -7696	190	P602-1	R-182	1				
R-183	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 4,700,000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-110 grid	RC30BF475K (-63288-475)	N16-R-51174 -0231	63	H370-65	R-183	1				
R-184	Same as R-101	V-110 screen dropping										
R-185	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 27,000 ohms ±10%; 1 watt power dissipation;	V-110 plate dropping	RC30BF273K (-63288-273)	N16-R-50400 -0231	63	H370-40	R-185	1				

R-185 (cont)	F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec											
R-186	Same as R-176	V-108 and V-109 screen dropping										
R-187	Same as R-115	V-108 cathode										
R-188	Same as R-103	V-108 and V-109 grid bias										
R-189	Same as R-117	V-109 cathode bal adj										
R-190	Same as R-176	V-109 plate dropping										
R-191	Resistor, fixed: composition body style no 14, MBCA ref dwg group 2; total resistance 1000 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-112 grid metering	RC30BF102K (-63288-102)	N16-R-49923 -0231,	63	H370-48	R-191	1				
R-192	Same as R-110	V-112 grid metering										
R-193	Same as R-103	V-112 grid metering										
R-194	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 150 ohms ±10%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-112 grid	RC30BF151K (-63288-151)	N16-R-49626 -0231	273	H370-45	R-194	1				
R-195	Same as R-101	V-111 screen dropping										
R-196	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 12,000 ohms ±5%; 1 watt power dissipation; F characteristic; 0.750″ lg × 0.280″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-112 cathode metering	RC30BF123J (-63291-123)	N16-R-50308 -0751	63	H370-63	R-196	1				
R-197	Same as R-104	V-112 cathode										

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
				RESISTORS (continued)								
R-198	Resistor, fixed: composition; body style no 14, MBCA ref dwg group 2; total resistance 10,000 ohms ±10%; 2 watt power dissipation; F characteristic; 1.78″ lg × 0.405″ diam max; insulated; resistant to humidity and salt water immersion cycling; 2 axial wire lead term; JAN-R-11 spec	V-112 screen dropping	RC41BF103K	N16-R-50283 -711	63	P634-39	R-198	1				
R-199	Resistor, fixed: wire wnd; body style no 20, MBCA ref dwg group 2; inductive wnd; 4 ohms ±5%; 12 watt power dissipation; 275°C max cont operating temp; 2″ lg × 19/32″ OD; vitreous enamel coated; resistant to salt water immersion; 2 solder lug term; 5/8″ lg × 21/64″ wd max; requires 5/16″ diam mtg hole for 2½″ lg mtg screw; JAN-R-26A spec	I-101 voltage divider	RW32D4RO	N16-R-65141 -3896	190	MO43-36	R-199, R-200	2				
R-200	Same as R-199	I-101 voltage divider										
R-201	Same as R-181	V-115 plate dropping										
R-202	Resistor, fixed: wire wnd; body style no 20, MBCA ref dwg group 2; inductive wnd; 6300 ohms ±5%; 18 watt power dissipation; 275°C max cont operating temp; 3″ lg × 19/32″ OD; vitreous enamel coated, resistant to salt water immersion; 2 solder lug term, 5/8″ lg × 21/64″ wd max; requires 5/16″ diam mtg bracket for vertical mtg bracket; JAN-R-26A	V-114 plate dropping	RW33G632		190	MO43-35	R-202	1				
R-203	Resistor, thermal: 10 ohms nominal resistance, 120°F ambient temp; 0.6 amp nominal operating current; 7.7 volt max operating voltage, 3 volt working range; designed for AC/DC; ballast tube type, 9-T	Current regulator	6-4	N16-T-56090	6-4		R-203	1	1	1	1	1

R-203 (cont)	bulb, MBCA ref dwg group 7, 3$\frac{9}{16}$″ lg o/a; octal base for socket mtg; moisture resistant; ballast tube type 6-4											
				SWITCHES								
S-101	Switch, rotary: 3 sections; 5 positions, max no of switching positions possible; non-"pile-up" type; 6 poles, 5 throws; spring brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; 2″ lg max × 1$\frac{5}{8}$″ wd × 1$\frac{7}{8}$″ h; mts by $\frac{3}{8}$″-32 thrd bushing, $\frac{3}{8}$″ lg, and $\frac{1}{8}$″ wd key, $\frac{17}{32}$″ from vertical center line at 9 o'clock, double flatted type shaft, 0.218″ sq × $\frac{7}{8}$″ lg; solder lug term	Test-Operate sw		N17-S-66104 -4501	111	P611-1	S-101	1				
S-101A	Switch section, rotary: 1 section, 5 positions max no of switching positions possible; non-"pile-up" type contact arrangement, 2 poles, 5 throws; spring brass contacts, silver plated contact finish; grade L-4 ceramic wafer body; 1$\frac{5}{8}$″ wd × 1$\frac{7}{8}$″ h; mts by two 0.128″ diam holes on vertical center line 1$\frac{9}{16}$″ c to c; solder lug terminals; part of S-101	S-101 rotary switch section			111	P611-2	S-101A, S-101B, S-101C	3	1	1	1	1
S-101B	Same as S-101A	S-101 rotary switch section										
S-101C	Same as S-101A	S-101 rotary switch section										
S-101D	Detent, switch: provisions for 5 switch positions; non-adjustable stop; 2$\frac{7}{8}$″ lg × 1$\frac{33}{64}$″ wd × 1$\frac{7}{8}$″ h; mts by a $\frac{3}{8}$″-32 thrd bushing, $\frac{3}{8}$″ lg, and a $\frac{1}{8}$″ wd key, $\frac{17}{32}$″ from vertical center line at 9 o'clock; two 0.128″ diam mtg holes on vertical center line spaced 1$\frac{9}{16}$″ c to c; part of S-101	S-101 switch detent			111	P611-3	S-101D	1				
S-102	Switch, rotary: 1 section; 3 positions, max no of switching positions possible; non-"pile-up" type; 3 poles, 3 throws; spring brass contacts; silver-plated contact finish; grade L-4 ceramic wafer body; 1$\frac{1}{8}$″ lg × 1$\frac{5}{8}$″ wd × 1$\frac{7}{8}$″ h; mts by a $\frac{3}{8}$″-32 thrd bushing $\frac{3}{8}$″ lg, and a $\frac{1}{8}$″ wd key $\frac{17}{32}$″ from vertical center line at 9 o'clock; double flatted type shaft; $\frac{3}{8}$″ lg × 0.218″ across flats w/0.250″ o/a diam; solder lug term	Metering sw		N17-S-62120 -9601	111	P619-1	S-102	1	1	1	1	1

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				SWITCHES (continued)								
S-103	Switch, rotary: 1 section; 5 positions, max no of switching positions possible; non-"pile-up" type; 2 poles, 5 throws; spring-brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; 1⅛″ lg × 1⅝″ wd × 1⅞″ h; mts by a ⅜″-32 thrd bushing ⅜″ lg, and a ⅛″ wd key 17/32″ from vertical center line at 9 o'clock; double flatted type shaft; ⅞″ lg × 0.218″ across flats w/0.250″ o/a diam; solder lug term	Input filter sw		N17-S-61497 -1571	111	P612-1	S-103	1	1	1	1	1
S-104	Switch, rotary: 4 sections; 8 positions max no of switching positions possible; non-"pile-up" type; 4 poles, 8 throws; spring brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; 2 7/16″ lg × 1⅝″ wd × 1⅞″ h; mts by a ⅜″-32 thrd bushing ⅜″ lg, and a ⅛″ wd key 17/32″ from vertical center line at 9 o'clock; double flatted type shaft; ⅞″ lg × 0.218″ across flats w/0.250″ o/a diam; solder lug term	Multiplier sw		N17-S-66533 -6071	111	P613-1	S-104	1				
S-104A	Switch section, rotary: 1 section; 8 positions, max no of switching positions possible; non-"pile-up" contact arrangement, single pole, 8 throws; spring brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; 1⅝″ wd × 1⅞″ h; mts by two 0.128″ diam holes on vertical center line 1 9/16″ c to c; solder lug terminals; part of S-104	S-104 rotary switch section			111	P613-2	S-104A, S-104B, S-104C, S-104D	4	1	1	1	1
S-104B	Same as S-104A	S-104 rotary switch section										
S-104C	Same as S-104A	S-104 rotary switch section										
S-104D	Same as S-104A	S-104 rotary switch section										

S-104E	Detent, switch: provisions for 8 switch positions; non-adjustable stop; $3\frac{5}{16}''$ lg × $1\frac{33}{64}''$ wd × $1\frac{7}{8}''$ h; mts by a $\frac{3}{8}''$-32 thrd bushing, $\frac{3}{8}''$ lg, and a $\frac{1}{8}''$ wd key $\frac{17}{32}''$ from vertical center line at 9 o'clock; two 0.128″ diam mtg holes on vertical center line spaced $1\frac{9}{16}''$ c to c; part of S-104	S-104 switch detent			111	P613-3	S-104E	1				
S-105	Switch, rotary: single pole, single throw	Phase Mod sw				Part of R-161	S-105	1				
S-106	Switch, rotary: 1 section; 4 positions, max no of switching positions possible; non-"pile-up" type; 2 pole, 4 throws; spring brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; $1\frac{1}{8}''$ lg × $1\frac{5}{8}''$ wd × $1\frac{7}{8}''$ h; mts by a $\frac{3}{8}''$-32 thrd bushing $\frac{3}{8}''$ lg, and a $\frac{1}{8}''$ wd key $\frac{17}{32}''$ from vertical center line at 9 o'clock; double flatted type shaft, $\frac{7}{8}''$ lg, 0.218″ across flats w/0.250″ o/a diam; solder lug term	Crystal Osc sw		N17-S-61361 -5285	111	P601-1	S-106	1	1	1	1	1
S-107	Switch, rotary: 7 sections	Freq Range sw										
S-107A	Switch section, rotary: 1 section; 3 positions, max no of switching positions possible; non-"pile-up" type; 2 poles, 8 contacts; spring brass contacts; silver plated contact finish; grade L-4 ceramic wafer body; $\frac{3}{16}''$ h × $1\frac{5}{8}''$ wd × $1\frac{7}{8}''$ lg; mtg hole at center of wafer for flatted shaft 0.187″ across flats and 0.250″ across diam; solder lug term	V-110 crystal osc plate		N17-S-91897 -8781‡	111	P625-1	S-107A, S-107B, S-107C, S-107D, S-107E, S-107F, S-107G	7	1	1	1	1
S-107B	Same as S-107A	V-108 balanced mixer plate										
S-107C	Same as S-107A	V-109 balanced mixer plate										
S-107D	Same as S-107A	V-111 buffer amp grid										
S-107E	Same as S-107A	V-111 buffer amp plate										
S-107F	Same as S-107A	V-112 RF power amp plate										
S-107G	Same as S-107A	Output tuning										
S-108	Switch, toggle: double pole, single throw; 6 amp, 125 v; bakelite body; $\frac{23}{32}''$ lg × $\frac{23}{32}''$ wd × $1\frac{9}{32}''$ h max, excl term, barriers, bushing	Power sw		N17-S-73028 -9028	3	H340-5	S-108, S-109	2				

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
SWITCHES (continued)												
S-108 (cont)	and handle; bat type actuating handle, $\frac{11}{16}$″ lg excl lgth of bushing; 4 solder lug term located on back; $\frac{15}{32}$″-32 thrd single mtg hole bushing; dull white nickel handle; JAN-S-23 spec											
S-109	Same as S-108	Plate sw										
S-110	Switch, thermostatic: single pole, single throw; nickel plated brass case; $3\frac{23}{32}$″ lg × 0.625″ diam max; −100° to +400° F range, ±1°F differential; 10 amp 115 vac, 5 amp 230 vac; 2 wire pigtail type term, located axially at one end; requires 2 mtg brackets; adjustable operating temp, contacts to close on temp decrease, contacts set at 70°C; part of E-119	Oven thermostat		N17-S-69871 -7951	858	P609-1	S-110	1				
TRANSFORMERS												
T-101	Transformer, power step-down and step-up: metal case, hermetically sealed; input data: 115/230 vac RMS, 60 cycles, single phase; 4 output windings, no. 1 secondary 720 v, no. 2 secondary 12.6 v, no. 3 secondary 5.25 v, no. 4 secondary 6.6 v, no. 1 secondary 0.250 amp, no. 2 secondary 3 amp, no. 3 secondary 3 amp, no. 4 secondary 10 amp, no. 1 and no. 4 secondary center tapped; vacuum impregnated and compound filled; MBCA ref dwg group 12, 5.875″ lg incl mounting flanges, 4.875″ wd max 5.125″ h max; 16 pillar type terminals, 1″ lg max, ½″ OD max, located on bottom; four 0.218″ dia mounting holes on 3.500″ × 5.375″ mtg centers; internal shielding	Power transformer			332	P632-1	T-101	1	1	1	1	1
T-102	Transformer, RF: 2 windings, single layer wound; inductance at	Mixer tank, 3.5-6.7 mcs			1; SA:8867	SA:8867	T-102	1				

T-102 (cont)	1000 cycles: primary 9.6 microhenries, secondary 3.2 microhenries; 20 turns on primary, 9 turns on secondary, #26AWG enameled copper wire; DC resistance: primary 0.25 ohms, secondary 0.116 ohms; 3.4 to 7 mc frequency range; primary center tapped; unshielded; $2\frac{11}{32}''$ lg × 1" dia; ceramic coil form w/powdered iron core; coil form $1\frac{13}{16}''$ lg × 1" dia; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; one $\frac{1}{4}''$-32 thrd mtg bushing, $\frac{11}{16}''$ lg through bottom of coil form; 5 solder lug term, two located on bottom end and 3 located on top end											
T-103	Transformer, RF: 2 windings, 2 pie universal wound; inductance at 1000 cycles: primary 35.8 microhenries, secondary 8.9 microhenries; 31 turns on primary, 15 turns on secondary #10/41 litz wire; DC resistance: primary 0.99 ohms, secondary 0.62 ohms; 1.75 to 3.6 mc frequency range; untapped, unshielded; $2\frac{3}{32}''$ lg × $\frac{3}{4}''$ dia; ceramic coil form w/powdered iron core; coil form $1\frac{9}{16}''$ lg × $\frac{3}{4}''$ dia; adjustableironcoretuningw/screwdriver adjustment located on bottom of coil form; one $\frac{1}{4}''$-32 thrd mtg bushing, $\frac{11}{16}''$ lg, through bottom of coil form; 4 solder lug term located 2 on each end	Mixer tank, 1.8-3.5 mcs			1; SA:8868	SA:8868	T-103	1				
T-104	Transformer, RF: 2 windings, 2 pie universal wound; inductance at 1000 cycles: primary 121 microhenries, secondary 8.3 microhenries; 59 turns on primary, 15 turns on secondary #10-41 litz wire; DC resistance: primary 1.94 ohms, secondary 0.63 ohms; 0.95 to 1.85 mc frequency range; untapped, unshielded; $2\frac{3}{32}''$ lg × $\frac{3}{4}''$ dia; ceramic coil form w/powdered iron core; coil form $1\frac{9}{16}''$ lg × $\frac{3}{4}''$ dia; adjustable iron core tuning w/screwdriver adjustment located on bottom of coil form; one $\frac{1}{4}''$-32 thrd bushing, $\frac{11}{16}''$ lg, through bottom of coil form; 4 solder lug term, located 2 on each end	Mixer tank, 1 0-1.8 mcs			1; SA:8869	SA:8869	T-104	1				
ELECTRON TUBES												
V-101	Electron tube: twin diode; metal envelope, RMA envelope MT-8;	Pulse limiter	6H6	N16-T-56346	6H6		V-101, V-102	2				

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				ELECTRON TUBES (continued)								
V-101 (cont)	7 pin type terminations located on bottom; receiving tube; JAN-1A spec											
V-102	Same as V-101	Pulse limiter										
V-103	Electron tube: twin triode; glass envelope; RMA envelope T-9; 8 pin type terminations located on bottom; receiving tube; JAN-1A spec	Cathode follower	6SN7WGT	N16-T-56684-25	6SN7WGT		V-103, V-106	2				
V-104	Electron tube: triode; metal envelope; RMA envelope MT-8; 6 pin type terminations located on bottom; receiving tube; JAN-1A spec	Cathode follower	6J5	N16-T-56350	6J5		V-104	1				
V-105	Electron tube: pentode; metal envelope; RMA envelope MT-8; 8 pin type terminations located on bottom; receiving tube; JAN-1A spec	Phase mod osc	6SJ7W		6SJ7W		V-105, V-107, V-110	3				
V-106	Same as V-103	Reactance mod										
V-107	Same as V-105	Frequency mod osc										
V-108	Electron tube: pentagrid converter; metal envelope; RMA envelope MT-8; 8 pin type terminations located on bottom; receiving tube; JAN-1A spec	Balanced mixer	6SA7	N16-T-56611	6SA7		V-108, V-109	2				
V-109	Same as V-108	Balanced mixer										
V-110	Same as V-105	Crystal osc										
V-111	Electron tube: pentode; metal envelope; RMA envelope MT-8; 8 pin type terminations located on bottom; receiving tube; JAN-1A spec	Buffer amp	6AC7W	N16-T-56140	6AC7W		V-111	1				
V-112	Electron tube: pentode; glass envelope; RMA envelope ST-16; 5	RF power amp	807	N16-T-68070	807		V-112	1				

V-112 (cont)	pin type terminations located on bottom w/1 cap type termination located on top; transmitting tube; JAN-1A spec											
V-113	Electron tube: diode; glass envelope; RMA envelope ST-12; 6 pin type terminations located on bottom; voltage regulator; JAN-1A spec	Voltage regulator	OD3/VR150	N16-T-53060	OD3/ VR150		V-113, V-115	2				
V-114	Electron tube: diode; glass envelope; RMA envelope ST-12; 6 pin type terminations located on bottom; voltage regulator; JAN-1A spec	Voltage regulator	OA3/VR75	N16-T-53030	OA3/ VR75		V-114	1				
V-115	Same as V-113	Voltage regulator										
V-116	Electron tube: twin diode; glass envelope; RMA envelope ST-16; 5 pin type terminations located on bottom; rectifier tube; JAN-1A spec	Full wave rectifier	5U4G	N16-T-55464	5U4G		V-116	1				
	INTERCONNECTING CABLES											
W-101*	Cable assembly, power, electrical: type AN MCOS-2; 2 conductors of #18 AWG stranded wire w/synthetic resin insulation; jute filler, copper braid shield, cotton wrap, rubber jacket covering; 2000 v dielectric test between conductors, 1500 v dielectric test between 1 conductor and gnd; 12′ lg overall; 1 AN plug connector type AN 3106B-14S-1S at first end; 1 AN plug connector type AN 3106B -14S-1P at second end; marked: Keyline; includes P-111, P-112	Keyline cable		‡	1; SA:8762	SA:8762	W-101	1				
W-102*	Cable assembly, power, electrical: type AN MCO2-2; 2 conductors of #18 AWG stranded wire w/synthetic resin insulation; jute filler, copper braid shield, cotton wrap, rubber jacket covering; 2000 v dielectric test between conductors, 1500 v dielectric test between 1 conductor and gnd; 12′ long overall; 1 AN plug connector type AN 3106 14S-1S at first end; 1 AN plug connector type AN 3106B 14S-1P at second end; marked: FM audio; includes P-109, P-110	FM Audio cable		‡	1; SA:8761	SA:8761	W-102	1				
W-103*	Cable assembly, power, electrical: type AN MCOS-2; 2 conductors	AC Power cable		‡	1; SA:8900	SA:8900	W-103	1				

* Supplied on KY-58/GRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
INTERCONNECTING CABLES (continued)												
W-103 (cont)	of #18 AWG stranded wire w/synthetic resin insulation; jute filler, copper braid shield, cotton wrap, rubber jacket; 2000 v dielectric test between conductors, 1500 v dielectric test between 1 conductor and gnd; 12' lg overall; 1 Hubbell body connector type #7559-6 at first end; 1 Hubbell armored cap type #7311-G at second end; marked: AC Power; includes P-113, P-114											
W-104	Clamp, electrical: beryllium copper w/silver plate finish; 1$\frac{1}{16}$" lg × $\frac{3}{8}$" wd × 0.260" h when shaped; two 0.156" diam mtg holes, $\frac{11}{16}$" c to c; used as grounding strap	L-121 frame gnd strap		‡	1; Q665-1	Q665-1	W-104	1				
W-105	Clamp, electrical: beryllium copper w/silver plate finish; 1.145" lg × $\frac{3}{8}$" wd × 0.380" h approx when shaped; one 0.156" diam mtg hole; used as grounding strap	L-121 tap connecting lead		‡	1; L623-1	L623-1	W-105	1				
W-106*	Cable assembly, RF: AN type RF coaxial cable No RG-59/U; 52 ohms characteristic impedance, 4000 v rms max operating voltage; single conductor, 7 strands of No 21 AWG copper wire, plain finish; synthetic resin insulation, 0.285" dia; single tinned copper shield; rd shape; 0.405" OD; black vinyl jacket; 12' lg overall; 1 Navy type plug —49195 located at each end; marked: Ext. Osc; includes P-107, P-108	Ext Osc cable		‡	1; SA:8760	SA:8760	W-106	1				
W-107*	Cable assembly, RF: AN type RF coaxial cable No RG-8/U; 52 ohms characteristic impedance, 4000 v rms max operating voltage; single conductor, 7 strands of No 21 AWG copper wire, plain finish; synthetic resin insulation, 0.285" dia; single tinned copper shield;	RF Freq meter cable		‡	1; SA:8758	SA:8758	W-107	1				

W-107* (cont)	rd shape, 0.405″ OD; black vinyl jacket; 12′ lg overall; 1 Navy type plug −49195 located at each end; marked: Freq Meter RF; includes P-105, P-106											
W-108*	Cable assembly, RF: AN type RF coaxial cable No RG-8/U; 52 ohms characteristic impedance, 4000 v rms max operating voltage; single conductor, 7 strands of No 21 AWG copper wire, plain finish; synthetic resin insulation, 0.285″ dia; single tinned copper shield; rd shape, 0.405″ OD; black vinyl jacket; 12′ lg overall; 1 Navy type plug −49195 located at each end; marked: Keyer Output; includes P-103, P-104	Keyer Output cable		‡	1; SA:8759	SA:8759	W-108	1				
W-109†	Cable assembly, special purpose: 3 type RG-59/U conductors of No 22 AWG stranded wire w/polyethylene insulation; 10 type SR1R -½(7)-18 conductors of no 18 AWG stranded wire w/synthetic resin insulation; 10 type SR1R-1 (7)-20 conductors of No 20 AWG stranded wire w/synthetic resin insulation; vinylite tape w/lacquered covered nylon cord jacket; tinned copper braid shield around each of the 3 type RG-59/U conductors; 6′ 3″ lg o/a; 1 Cannon plug connector type DPD-33P w/special insert on first end; 1 Cannon plug connector type DPD-33S w/special insert on second end	Service cable		‡	1; SA:8903	SA:8903	W-109	1				
					CRYSTALS							
Y-101#	Crystal unit						Y-101, Y-102, Y-103	3				
Y-102#	Same as Y-101											
Y-103#	Same as Y-101											
					FILTERS							
Z-101	Filter, low pass: 300 cycle cutoff, 0 to 300 cycle bandwidth; 5000 ohms input, 5000 ohms output; 3″ lg × 3″ wd × 3$\frac{13}{16}$″ h; round, metal case; four 0.1695″ diam mtg holes on 2⅜″ × 2⅜″ mtg/c; 3	60 dot-cycle filter		N16-F-44012 -8347	123	P623-1	Z-101	1				

* Supplied on KY-58/GRT only
† Supplied on KY-75/SRT only
‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.
# Government furnished

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	KY-58/GRT		KY-75/SRT	
									BOX	QUAN.	BOX	QUAN.
				FILTERS (continued)								
Z-101 (cont)	solder lug term; hermetically sealed; JAN-T-27 spec											
Z-102	Filter, low pass: 500 cycle cutoff, 0 to 500 cycle bandwidth; 5000 ohms input; 5000 ohms output; 3″ lg × 3″ wd × $3\frac{13}{16}$″ h; round, metal case; four 0.1695″ diam mtg holes on $2\frac{3}{8}$″ × $2\frac{3}{8}$″ mtg/c; 3 solder lug term; hermetically sealed; JAN-T-27 spec	100 dot-cycle filter		N16-F-44017 -3341	123	P622-1	Z-102	1				
Z-103	Filter, low pass: 1000 cycle cutoff; 0 to 1000 cycle bandwidth; 5000 ohms input, 5000 ohms output; $2\frac{9}{16}$″ lg × $2\frac{9}{16}$″ wd × $3\frac{5}{16}$″ h; round metal case; four 0.1695″ diam mtg holes on $2\frac{3}{32}$″ × $2\frac{3}{32}$″ mtg/c; 3 solder lug term; hermetically sealed; JAN-T-27 spec	200 dot-cycle filter		N16-F-44028 -4351	123	P621-1	Z-103	1				
Z-104	Filter, low pass: 1200 cycle cutoff; 0 to 1200 cycle bandwidth; 5000 ohms input; 5000 ohms output; $2\frac{9}{16}$″ lg × $2\frac{9}{16}$″ wd × $3\frac{5}{16}$″ h; round metal case; four 0.1695″ diam mtg holes on $2\frac{3}{32}$″ × $2\frac{3}{32}$″ mtg/c; 3 solder lug term; hermetically sealed; JAN-T-27 spec	240 dot-cycle filter		N16-F-44030 -6361	123	P620-1	Z-104	1				
Z-105	Transformer, RF: 1 winding, 2 pie universal wnd; 43 microhenries to tap, 117 microhenries total at 1000 cycles; 45 turns to tap, 90 turns total of #10/41 ESN wire; 1.12 ohms to tap; 1.24 ohms total DC resistance; 200 kc ± 1 kc peak freq; tapped at 45 turns; aluminum rectangular shield can w/caustic etch finish; $3\frac{11}{32}$″ lg × 2″ wd × $1\frac{9}{16}$″ d; glass melamine coil form w/powdered iron core; coil form $2\frac{13}{16}$″ lg × $\frac{1}{2}$″ diam; adjustable iron core tuning w/screwdriver adjustment thru bottom of can; two #6-32 mtg holes on 1.406″	V-107 plate tank			1; SA:8876	SA:8876	Z-105	1				

Z-105 (cont)	× 0.312" mtg/c; 4 stud type term located on bottom of can; includes L-104, C-121											
Z-106	Transformer, RF: 1 winding, universal wound; 10 microhenries to tap, 205 microhenries total at 1000 cycles; 20 turns to tap, 99 turns total of #10/41 ESN wire; 0.52 ohms to tap, 2.89 ohms total; 200 kc ±1 kc peak freq; tapped at 20 turns; aluminum rectangular shield can w/caustic etch finish; $3\frac{11}{32}''$ lg × 2" wd × $1\frac{9}{16}''$ d; glass melamine coil form w/powdered iron core; coil form $2\frac{13}{16}''$ lg × $\frac{1}{2}''$ diam; adjustable iron core tuning w/screwdriver adjustment thru bottom of can; two #6-32 mtg holes on 1.406" × 0.312" mtg/c; 4 stud type term located on bottom; shield stamped L-103; part of E-119; includes C-115, C-116, L-103	V-107 grid tank			1; SA:8884	SA:8884	Z-106	1				
				HEATERS								
HR-101	Resistor, fixed: wire wnd; body style no 16, MBCA ref dwg group 2; non-inductive wnd; 150 ohms ±10%; 125 watt power dissipation, 340°C max cont operating temp; $5\frac{3}{4}''$ lg × 3" wd × $\frac{19}{32}''$ d; vitreous enamel coating, resistant to humidity; 2 solder lug, radial, term, $\frac{1}{2}''$ lg × $\frac{3}{16}''$ wd; requires vertical mtg brackets; two $\frac{7}{16}''$ lg × $\frac{7}{32}''$ wd mtg holes; part of E-119	Oven heater		N16-R-65732 -1318	190	P608-1	HR-101, HR-102, HR-103, HR-104	4				
HR-102	Same as HR-101; part of E-119	Oven heater										
HR-103	Same as HR-101; part of E-119	Oven heater										
HR-104	Same as HR-101; part of E-119	Oven heater										
				TERMINAL BOARDS								
TB-101	Terminal board: glass melamine; 9 double ended stud type term; w/o barrier; $4\frac{1}{2}''$ lg × 1" wd × $\frac{13}{16}''$ h; two 0.196" diam mtg holes spaced 4" c to c; 9 term marked 1, 2, 3, 4, 5, 6, 7, 8, 9; wax impregnated panel; part of E-119	Terminal board		‡	1; SA:8897	SA:8897	TB-101	1				
TB-102	Terminal board: glass melamine; 9 stud type term; w/o barrier; $4\frac{1}{2}''$ lg × 1" wd × $\frac{39}{64}''$ h; two 0.196" diam mtg holes spaced 4"	Terminal board		‡	1; SA:8858	SA:8858	TB-102	1				

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
TERMINAL BOARDS (continued)												
TB-102 (cont)	c to c; 9 term marked 1, 2, 3, 4, 5, 6, 7, 8, 9; wax impregnated panel											
TB-103	Mounting: glass melamine; wax impregnated; holds resistors or capacitors by means of 2 term studs spaced 1.125'' c to c; two 0.156'' diam mtg holes spaced $2\frac{1}{16}''$ c to c; for mtg resistors and capacitors; marked: C-133, R-187, C-135, C-138, C-134, R-176, R-186, C-137, C-139, R-190	Terminal board		‡	1; SA:8881	SA:8881	TB-103	1				
TB-104	Mounting: glass melamine; wax impregnated; holds resistors or capacitors by means of 2 term studs spaced 1.125'' c to c; two 0.156'' diam mtg holes spaced $2\frac{1}{16}''$ c to c; marked: R-180, C-119, R-179, R-178, C-160, R-177, C-117, C-113, C-110	Terminal board		‡	1; SA:8883	SA:8883	TB-104	1				
TB-105	Mounting: glass melamine; wax impregnated; holds resistors or capacitors by means of 2 term studs spaced 1.125'' c to c; two 0.156'' diam mtg holes spaced $1\frac{11}{16}''$ c to c; for mtg resistors and capacitors, marked: R-195, C-143, C-144, R-191, R-192, R-193, C-145	Terminal board		‡	1; SA:8882	SA:8882	TB-105	1				
TB-106	Mounting: glass melamine; wax impregnated; holds resistors or capacitors by means of 2 term studs spaced 1.125'' c to c; four 0.156'' diam mtg holes spaced $3\frac{1}{4}''$, $3\frac{9}{16}''$, and $3\frac{1}{4}''$ c to c at $\frac{23}{32}''$ from one end of panel; for mtg resistors and capacitors, marked: R-110, R-111, R-113, R-118, R-109, R-108, R-112, R-120, R-115, R-103, R-105, R-104, R-163, C-105, R-166, R-165, R-121, R-119, R-123, R-125, R-101, C-107, R-167, C-108, R-169, C-109, R-164, R-170, R-142, R-124	Terminal board		‡	1; SA:8896	SA:8896	TB-106	1				

SOCKETS

XF-101	Fuse holder: extractor post type; 115 v, 15 amp; accommodates 1 cartridge fuse $1\frac{1}{4}''$ lg × $\frac{1}{4}''$ diam; molded black bakelite body; nickel plated brass contacts, tension type; $2\frac{7}{16}''$ lg × $\frac{43}{64}''$ diam; 2 solder lug term; thrded body for $\frac{1}{2}''$ diam mtg holes	F-101 fuse holder		N17-F-74266-9235	324	H477-1	XF-101 thru XF-106	6				
XF-102	Same as XF-101	F-102 fuse holder										
XF-103	Same as XF-101	F-103 fuse holder										
XF-104 thru XF-106	Same as XF-101	F-101 thru F-103 spare fuse holder										
XI-101	Light, indicator: supplied w/amber lens, smooth faced w/frosted back, $\frac{1}{2}''$ diam; friction mtd lens holder; accommodates T-3 $\frac{1}{4}$ lamp, MBCA ref dwg group 7; miniature bayonet base; 6 to 8 v, 0.15 amp; enclosed brass shell w/black nickel finish; $2\frac{3}{8}''$ lg × $\frac{3}{4}''$ diam; one $\frac{11}{16}''$ diam mtg hole required; accommodates up to $\frac{3}{16}''$ thick panel; horizontally mtd, lamp replaceable from front of panel; 2 solder lug term located on opposite side of base, both insulated from shell; JAN-I-6 spec	I-101 lamp holder			317	P616-1	XI-101	1				
XI-101A	Diffusor, light: concentric type; brass w/black nickel finish; $\frac{15}{16}''$ lg × $\frac{13}{16}''$ diam over-all; mts by $\frac{9}{16}''$-27 male threaded bushing, $\frac{3}{16}''$ lg; part of XI-101	XI-101 dimmer			317	P616-4	XI-101A	1				
XI-102	Light, indicator: supplied w/red lens, smooth faced w/frosted back, $\frac{1}{2}''$ diam; friction mtd lens holder; accommodates T-3$\frac{1}{4}$ lamp, MBCA ref dwg group 7; miniature bayonet base; 6 to 8 v; 0.15 amp; enclosed brass shell w/black nickel finish; $2\frac{3}{8}''$ lg × $\frac{3}{4}''$ diam; one $\frac{11}{16}''$ diam mtg hole required; accommodates up to $\frac{3}{16}''$ thick panel; horizontally mtd, lamp replaceable from front of panel; 2 solder lug term located on opposite side of base, both insulated from shell; JAN-I-6 spec	I-102 lamp holder			317	P616-2	XI-102	1				
XI-102A	Diffusor, light: concentric type; brass w/black nickel finish; $\frac{15}{16}''$ lg × $\frac{13}{16}''$ diam over-all; mts by	XI-102 dimmer			317	P616-5	XI-102A	1				

‡ Not furnished as a maintenance part. If failure occurs, do not request replacement unless the item cannot be repaired or fabricated.

TABLE 8-4. COMBINED PARTS AND REPAIR PARTS LIST FOR KEYERS KY-58/GRT AND KY-75/SRT

PARTS									EQUIP. REPAIR PARTS			
									KY-58/GRT		KY-75/SRT	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	STANDARD NAVY AND (SIGNAL CORPS) STOCK NO.	MFGR. AND MFGR'S. DESIG-NATION	CON-TRACTOR DRAW-ING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOT. NO. PER EQ.	BOX	QUAN.	BOX	QUAN.
	SOCKETS (continued)											
XI-102A (cont)	9/16″-27 male threaded bushing, 3/16″ lg; part of XI-102											
XI-103	Light, indicator: supplied w/white lens, smooth faced w/frosted back, 1/2″ diam; friction mtd lens holder; accommodates T-3 1/4 lamp; MBCA ref dwg group 7; miniature bayonet base; 6 to 8 v, 0.15 amp; enclosed brass shell w/black nickel finish; 2 3/8″ lg × 3/4″ diam; one 11/16″ diam mtg hole required; accommodates up to 3/16″ thick panel; horizontally mtd, lamp replaceable from front of panel; 2 solder lug term located on opposite side of base, both insulated from shell; JAN-I-6 spec	I-103 lamp holder			317	P616-3	XI-103	1				
XI-103A	Diffusor, light: concentric type; brass w/black nickel finish; 15/16″ lg × 13/16″ diam over-all; mts by 9/16″-27 male threaded bushing, 3/16″ lg; part of XI-103	XI-103 dimmer			317	P616-6	XI-103A	1				
XR-101	Socket, electron tube: 8 silver plated phosphor bronze contacts; medium size; round shape; 1 7/8″ lg × 1 1/2″ wd × 5/16″ d o/a; grade L-4 ceramic body; under chassis mtg; two 0.152″ diam mtg holes spaced 1 1/2″ c to c; 1 3/16″ diam chassis hole required	R-203 socket	(-49398)	N16-S-63517 -6481	1; SA:2640	SA:2640	XR-101, XV-101 thru XV-111, XV-113 thru XV-116	16				
XV-101 thru XV-111	Same as XR-101	V-101 thru V-111 tube socket										
XV-112	Socket, electron tube: 5 silver plated phosphor bronze contacts; medium size; round; 1 3/8″ o/a diam × 0.385″ d, excl term; grade L-5 ceramic body; requires retainer ring mtg; 1 3/16″ chassis hole required; JAN-I-10 spec	XV-112 tube socket		N16-S-61704 -1060	1; SA:2627	SA:2627	XV-112	1				
XV-113 thru XV-116	Same as XR-101	V-113 thru V-116 tube socket										

XY-101	Socket, crystal: accommodates 0.115″ diam contact pins spaced 0.500″ apart; medium sized; rectangular shape; $1\frac{1}{16}''$ lg × $\frac{7}{16}''$ wd × $\frac{5}{16}''$ d; grade L-5 ceramic body; above chassis mtg; two 0.375″ diam, and one 0.125″ diam, chassis holes required; one 0.125″ diam mtg hole on center line; part of E-119	Y-101 holder	(-492000)	N16-S-54393 -7314	1; SA:5030	SA:5030	XY-101, XY-102, XY-103	3				
XY-102	Same as XY-101; part of E-119	Y-102 holder										
XY-103	Same as XY-101; part of E-119	Y-103 holder										
XY-104	Socket, crystal: accommodates 0.145″ diam contact pins spaced 0.750″ apart; medium sized; rectangular shaped; $1\frac{1}{8}''$ lg × $\frac{1}{2}''$ wd × $\frac{15}{32}''$ d; grade L-5 ceramic body; above chassis mtg; two 0.313″ diam, and one 0.144″ diam, chassis holes required; one 0.144″ diam mtg hole on center line; part of E-119	Y-101 holder			1; SA:8899	SA:8899	XY-104, XY-105, XY-106	3				
XY-105	Same as XY-104; part of E-119	Y-102 holder										
XY-106	Same as XY-104; part of E-119	Y-103 holder										

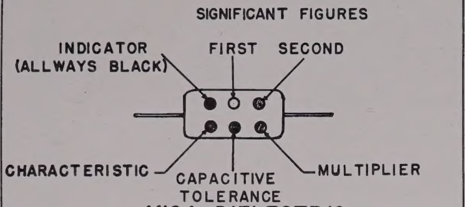
TABLE 8-5. CROSS REFERENCE PARTS LIST

JAN DESIGNATIONS	KEY SYMBOL
AN3057-6	O-149
AN3057-10	O-187
AN3064-8	O-189
AN3064-10	O-188
AN3102-14S-1P	J-101
AN3106B-14S-1P	P-110
AN3106B-14S-1S	P-109
CC21SL050C	C-155
CC21SL220K	C-123
CC21SL470K	C-133
CM20B271K	C-117
CM30E132J	C-107
CM35A102K	C-110
CM35B103M	C-105
CM35B472J	C-121
CM35B472K	C-111
CM35E272J	C-116
CM35E621J	C-115
CP06SA2	O-135
CP06SA4	O-130
CP06SA6	O-132
CP41B1DF205V	C-101
CP41B1DF405V	C-157
CP54B1EF104K	C-153
CP54B6EF104V	C-161
CP61B1EF104K	C-118
CP61B1EF105K	C-102
CP61B1EF504K	C-103
CV11B130	C-129
CY-1132/GRT	A-104
CY-1133/SRT	A-105
MR25W001DCMA	M-101
RA20ASA252AK	R-116
RA20A2RD751AK	R-102
RA20A2SA102AK	R-117
RA20A2SA103AK	R-122
RA20A2SA352AK	R-106
RA20A2SA502AK	R-114
RA25B2FG102AK	R-161
RB10B02110F	R-141
RB10B02900F	R-140
RB10B03310F	R-139
RB10B04620F	R-138
RB10B07640F	R-134
RB10B11340F	R-135
RB10B22000F	R-136
RB10B25000F	R-172
RB10B26600F	R-129
RB10B36561F	R-137
RB10B38300F	R-128
RB10B42200F	R-127
RB10B44150F	R-126
RB10B46100F	R-130
RB10B47080F	R-131
RB10B47400F	R-132
RB10B48050F	R-133
RC30BF102K	R-191
RC30BF103K	R-103
RC30BF104K	R-101
RC30BF105K	R-163
RC30BF123J	R-196
RC30BF151K	R-194
RC30BF152K	R-121
RC30BF221K	R-107
RC30BF222K	R-110
RC30BF223K	R-124
RC30BF224K	R-108
RC30BF273K	R-185
RC30BF332K	R-105
RC30BF333K	R-176
RC30BF334K	R-167
RC30BF471K	R-115
RC30BF472K	R-113
RC30BF473K	R-165
RC30BF475K	R-183
RC30BF680K	R-104
RC30BF681K	R-118
RC30BF682K	R-111
RC30BF821J	R-164
RC41BF103K	R-198
RV2AYSA504F	R-162
RW32D4RO	R-199
RW32F402	R-181
RW33G632	R-202
TB-14	I-101
OA3/VR75	V-114
OD3/VR150	V-113
5U4G	V-116
6-4	R-203
6AC7W	V-111
6H6	V-101
6J5	V-104
6SA7	V-108
6SJ7W	V-105
6SN7WGT	V-103
807	V-112

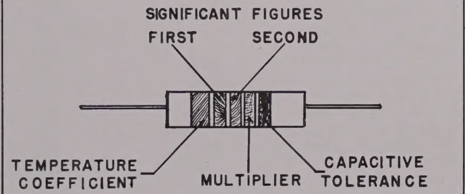
STANDARD NAVY STOCK NO.	KEY SYMBOL
G17-L-6297	I-101
N16-B-750001-523	O-178
N16-C-15625-4505	C-155
N16-C-16157-6400	C-123
N16-C-16541-7014	C-133
N16-C-29613-2676	C-117
N16-C-30373-1943	C-115
N16-C-31090-4203	C-110
N16-C-31349-1699	C-107
N16-C-32140-4743	C-116
N16-C-32641-6328	C-121
N16-C-32646-6808	C-111
N16-C-33627-7705	C-105
N16-C-45777-1074	C-118
N16-C-45777-3177	C-153
N16-C-47297-1111	C-103
N16-C-48817-1090	C-102
N16-C-49221-9933	C-101
N16-C-49981-9993	C-157
N16-C-53204-4098	C-161
N16-C-61716-5075	C-114
N16-C-63576-1001	C-127
N16-C-63965-2800	C-129
N16-C-170001-333	H-103
N16-C-300442-625	O-101
N16-C-300798-452	O-111
N16-C-300798-621	O-114
N16-C-300798-866	O-110
N16-F-44012-8347	Z-101
N16-F-44017-3341	Z-102
N16-F-44028-4351	Z-103
N16-F-44030-6361	Z-104
N16-H-150001-289	O-162
N16-H-500001-131	O-173
N16-K-700310-997	E-113
N16-K-700346-101	E-105
N16-M-60906-8018	O-132
N16-M-60958-3571	O-135
N16-M-60958-3591	O-130
N16-M-61518-6457	O-119
N16-R-29190-2218	L-122
N16-R-49500-0231	R-104
N16-R-49626-0231	R-194
N16-R-49662-0231	R-107
N16-R-49770-0231	R-115
N16-R-49842-0231	R-118
N16-R-49876-0751	R-164
N16-R-49923-0231	R-191
N16-R-49968-0231	R-121
N16-R-50013-0231	R-110
N16-R-50067-0231	R-105
N16-R-50130-0231	R-113
N16-R-50202-0231	R-111
N16-R-50283-711	R-198
N16-R-50283-0231	R-103
N16-R-50308-0751	R-196
N16-R-50373-0231	R-124
N16-R-50400-0231	R-185
N16-R-50418-0231	R-176
N16-R-50481-0231	R-165
N16-R-50634-0231	R-101
N16-R-50715-0231	R-108
N16-R-50760-0231	R-167
N16-R-50976-0231	R-163
N16-R-51174-0231	R-183
N16-R-65141-3896	R-199
N16-R-65619-7696	R-182
N16-R-65732-1318	HR-101
N16-R-66214-5436	R-181
N16-R-78964-7599	R-141
N16-R-78987-6666	R-140
N16-R-79154-5459	R-129
N16-R-79173-5665	R-128
N16-R-79193-3519	R-131
N16-R-79193-6399	R-132
N16-R-79298-6139	R-172
N16-R-79321-2251	R-137
N16-R-87419-5160	R-116
N16-R-90754-3631	R-117
N16-R-90754-3965	R-161
N16-R-90933-3980	R-106
N16-R-91031-1135	R-114
N16-R-91291-4930	R-122
N16-R-92495-9360	R-143
N16-R-501081-117	O-137
N16-S-20980-3492	O-121
N16-S-21048-7974	O-120
N16-S-54393-7314	XY-101
N16-S-61704-1060	XV-112
N16-S-63517-6481	XR-101
N16-T-53030	V-114
N16-T-53060	V-113
N16-T-55464	V-116
N16-T-56090	R-203
N16-T-56140	V-111
N16-T-56346	V-101
N16-T-56350	V-104
N16-T-56611	V-108
N16-T-56684-25	V-103
N16-T-68070	V-112
N17-C-70328-1332	P-109
N17-C-70588-1329	P-110
N17-C-71413-4752	P-103
N17-C-72604-1338	J-101
N17-C-73108-5890	J-109
N17-C-73471-6417	J-103
N17-C-781366-251	O-149
N17-C-781444-504	O-186
N17-C-800646-151	E-121
N17-C-805751-551	O-140
N17-F-16302-60	F-103
N17-F-16302-160	F-101
N17-F-74266-9235	XF-101
N17-G-161530-484	O-129
N17-I-49475-1171	E-103
N17-I-69154-6206	E-104
N17-J-39248-4423	J-112
N17-M-19255-1051	M-101
N17-M-75215-9751	O-176
N17-R-64246-4619	K-101
N17-R-650211-112	O-150
N17-S-61361-5285	S-106
N17-S-61497-1571	S-103
N17-S-62120-9601	S-102
N17-S-66104-4501	S-101
N17-S-66533-6071	S-104
N17-S-69871-7951	S-110
N17-S-73028-9028	S-108
N17-S-91897-8781	S-107A
N17-S-250051-276	O-191
N18-T-3095-110	M-102
N41-W-2446	H-101

TABLE 8-6. COLOR CODES

CAPACITOR COLOR CODE

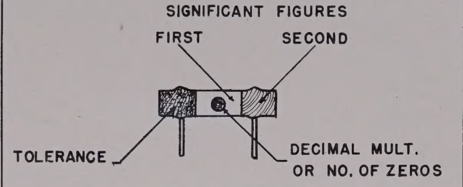


MICA-DIELECTRIC



CERAMIC-DIELECTRIC

RESISTOR COLOR CODE



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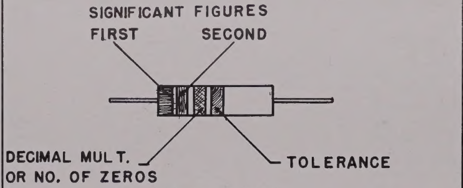
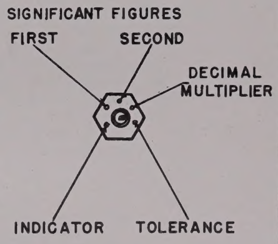


AXIAL TYPE

FEED-THRU TYPE CAPACITOR



CERAMIC-DIELECTRIC

RESISTORS			COLOR	CAPACITORS							
					MICA - DIELECTRIC			*CERAMIC - DIELECTRIC*			
										TOLERANCE	
DECIMAL MULTIPLIER OR NO. OF ZEROS	TOLERANCE	SIGNIFICANT FIGURE		SIGNIFICANT FIGURE	MULTIPLIER	CAPACITIVE TOL. IN %	CHARAC-TERISTIC	MULTIPLIER	TEMP. COEF. IN PARTS/MEG/°C	> 10 UUF IN %	< 10 UUF IN UUF
0		0	BLACK	0	1	20	A	1	0	20	2
1		1	BROWN	1	10		B	10	−30	1	
2		2	RED	2	100	2	C	100	−80	2	
3		3	ORANGE	3	1000		D	1000	−150		
4		4	YELLOW	4			E		−220		
5		5	GREEN	5			F		−330	5	.5
6		6	BLUE	6			G		−470		
7		7	VIOLET	7					−750		
8		8	GRAY	8				.01	+30		.25
9		9	WHITE					.1	−330 ± 500	10	1.0
.1	±5		GOLD		.1	5					
.01	±10		SILVER		.01	10					
	±20		NO COLOR								

TABLE 8-7. LIST OF MANUFACTURERS

CODE NO.	MFR'S PREFIX	NAME	ADDRESS
1	CNA	National Company, Inc.	61 Sherman St., Malden, Mass.
3	CHH	Arrow-Hart & Hegeman Elect. Co.	102 Hawthorne St., Hartford, Conn.
5	CMA	Mallory, P. R. Co., Inc.	1941 Thomas St., Indianapolis, Ind.
8	CMG	Cinch Mfg. Co.	2339 W. Van Buren St., Chicago, Ill.
11	CMC	Clarostat Mfg. Co.	285–287 N. 6th St., Brooklyn, N. Y.
13	CSF	Sprague Electric Co.	N. Adams, Mass.
14	CAW	Aerovox Corp.	742 Belleville Ave., New Bedford, Mass.
18	CG	General Electric Co. (Lamp Dept.)	Nela Park, Cleveland, Ohio
24		Humason Mfg. Co.	Forestville, Conn.
30		Mass. Machine Shop	817 Albany St., Roxbury, Mass.
46	CAS	American Lava Corp.	Cherokee Blvd. & Mfgr's Rd., Chattanooga, Tenn.
63	CIR	International Resistance Co.	401 No. Broad St., Philadelphia, Pa.
68		Laminated Sheet Products Corp.	259 "A" St., So. Boston, Mass.
76	CLF	Littlefuse, Inc.	4757 Ravenswood Ave., Chicago, Ill.
83	CER	Erie Resistor Corp.	644 W 12th St., Erie, Pa.
86	CDP	General Ceramics & Steatite Corp.	Crows Mill Rd., Keasbey, New Jersey
93	CHU	Hubbell Harvey Co.	447 Concord Ave., Bridgeport, Conn.
97		National Lockwasher Co.	Newark, New Jersey
111	COC	Oak Mfg. Co.	1200 N. Clybourne Ave., Chicago, Ill.
123	CUT	United Transformer Corp.	148 Varick St., New York, N. Y.
125	CAXP	Lord Mfg. Co.	1631 W. 12th St., Erie, Pa.
128	CPH	American Phenolic Corp.	1830 S. 54th Ave., Chicago, Ill.
158		Mason Lumber Co.	9 Dana St., Malden, Mass.
173	CAN	Sangamo Electric Co.	1935 Funk St., Springfield, Ill.
187	CAXH	Canfield Rubber Co.	Warren & Garden St., Bridgeport, Conn.
188	CV	Weston Electric Instrument Corp.	623 Frelinghuysen Ave., Newark, New Jersey
190	CAO	Ward Leonard Co.	6 South St., Mount Vernon, N. Y.
238		Peterson & Neville, Inc.	365 Dorchester Ave., So. Boston, Mass.
242	CMF	Electro Motive Mfg. Co.	Willimantic, Conn.
254	CCJ	Crowley, Henry L. Co.	1 Central Ave., West Orange, N. J.
262	CB1C	Selectar Industries, Inc.	401 East 138th St. Bronx, N. Y.
273	CBZ	Allen-Bradley Co.	118 W. Greenfield Ave., Milwaukee, Wis.
284		Radio Condenser Co.	Camden, New Jersey
289		Waldes Koh-I-Noor, Inc.	47–54 27th St., Long Island City, N. Y.
296	CA1S	Birtcher Corp.	4087 Huntington Drive, Los Angeles, Calif.
298	CAMQ	Cambridge Thermionic Corp.	445 Concord Ave., Cambridge, Mass.
317	CAYZ	Dial Light Corp. of America	900 Broadway, New York, N. Y.
324	CFA	Bussman Mfg. Co.	2538 W. University St., St. Louis, Mo.
332	CADF	Standard Transformer Corp.	Elston Kedzie & Addison, Chicago, Ill.
339	CED	Cannon Electric Development Co.	3291 Humboldt St., Los Angeles, Calif.
344		Nutile Machine Co.	95 Hemingway St., Winchester, Mass.
506		Smith & Welch, Printers	470 Atlantic Ave., Boston, Mass.
512		Tempco Mfg. Co.	3031 Hiawatha Ave., Minneapolis, Minn.
665		Automatic Products Corp.	124 West Boylston Drive, Worcester, Mass.
738	CAHC	Barker & Williamson	237 Fairfield Ave., Upper Darby, Pa.
858	CCM	Fenwal, Inc.	400 Main St., Ashland, Mass.
1238	CARO	Industrial Products, Co.	Brookfield St., Danbury, Conn.
1302	CPB	Price Electric Corp.	332 E. Church St. & 2nd St., Frederick, Md.
1316		H. P. L. Mfg. Co.	2003 E. 65th St., Cleveland, Ohio
1366		Progressive Steel Rule Die Co.	10 Allerton St., Lynn, Mass.
1367		Faultless Caster Corp.	30 Oliver St., Boston, Mass.
1368		Resistance Products Co.	714 Race St., Harrisburg, Pa.
1369	CBNB	Technology Instrument Corp.	531 Main St., Acton, Mass.
1370	CAYU	Barry Corp.	700 Pleasant St., Watertown, Mass.
1372		Triangle Screw Machine Products Co.	Cross St., Winchester, Mass.
1373		D. M. Watkins Co.	274 Pine St., Providence, R. I.

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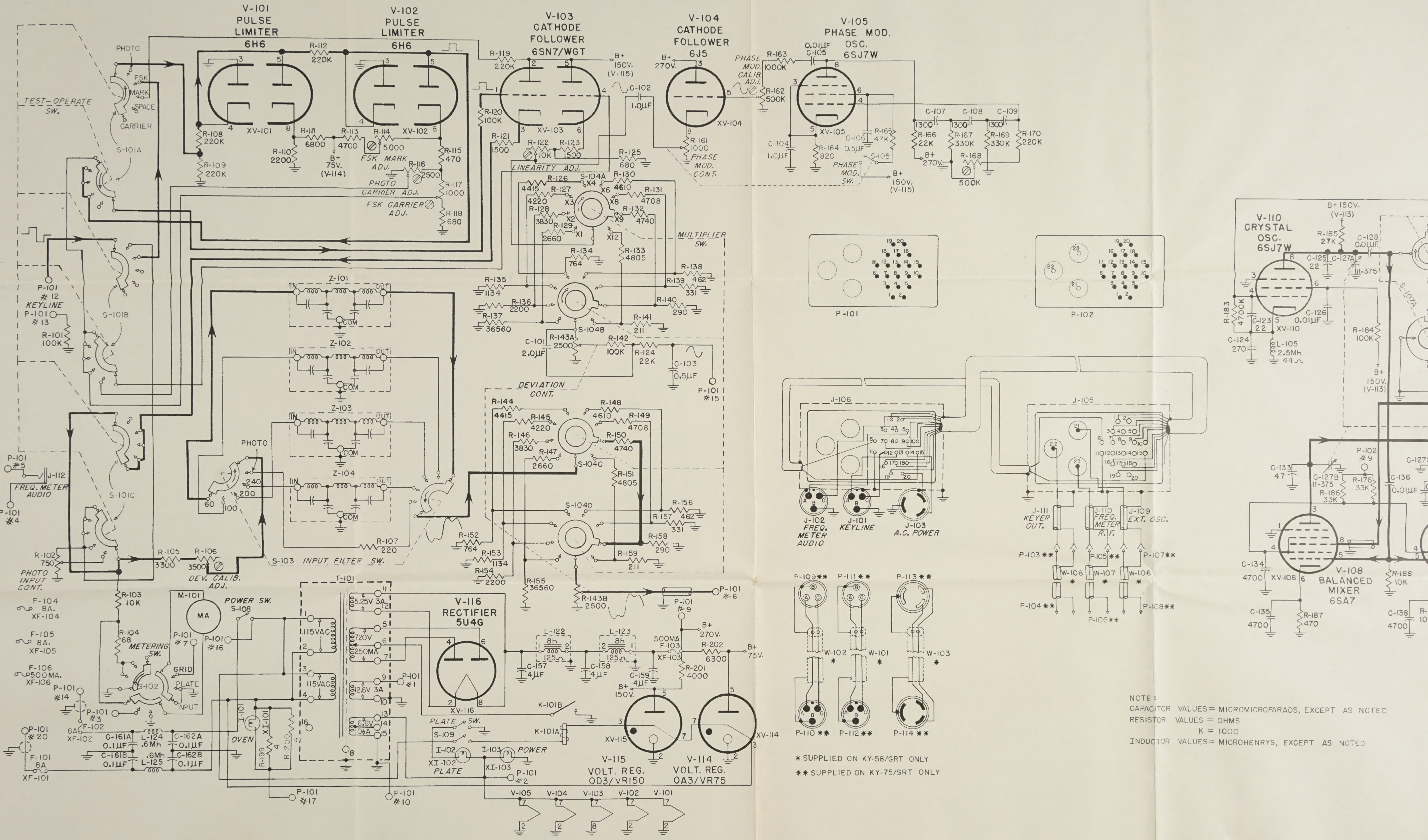
*Table



NOTE:
CAPACITOR VALUES = MICROMICROFARADS, EXCEPT AS NOTED
RESISTOR VALUES = OHMS
K = 1000
INDUCTOR VALUES = MICROHENRYS, EXCEPT AS NOTED

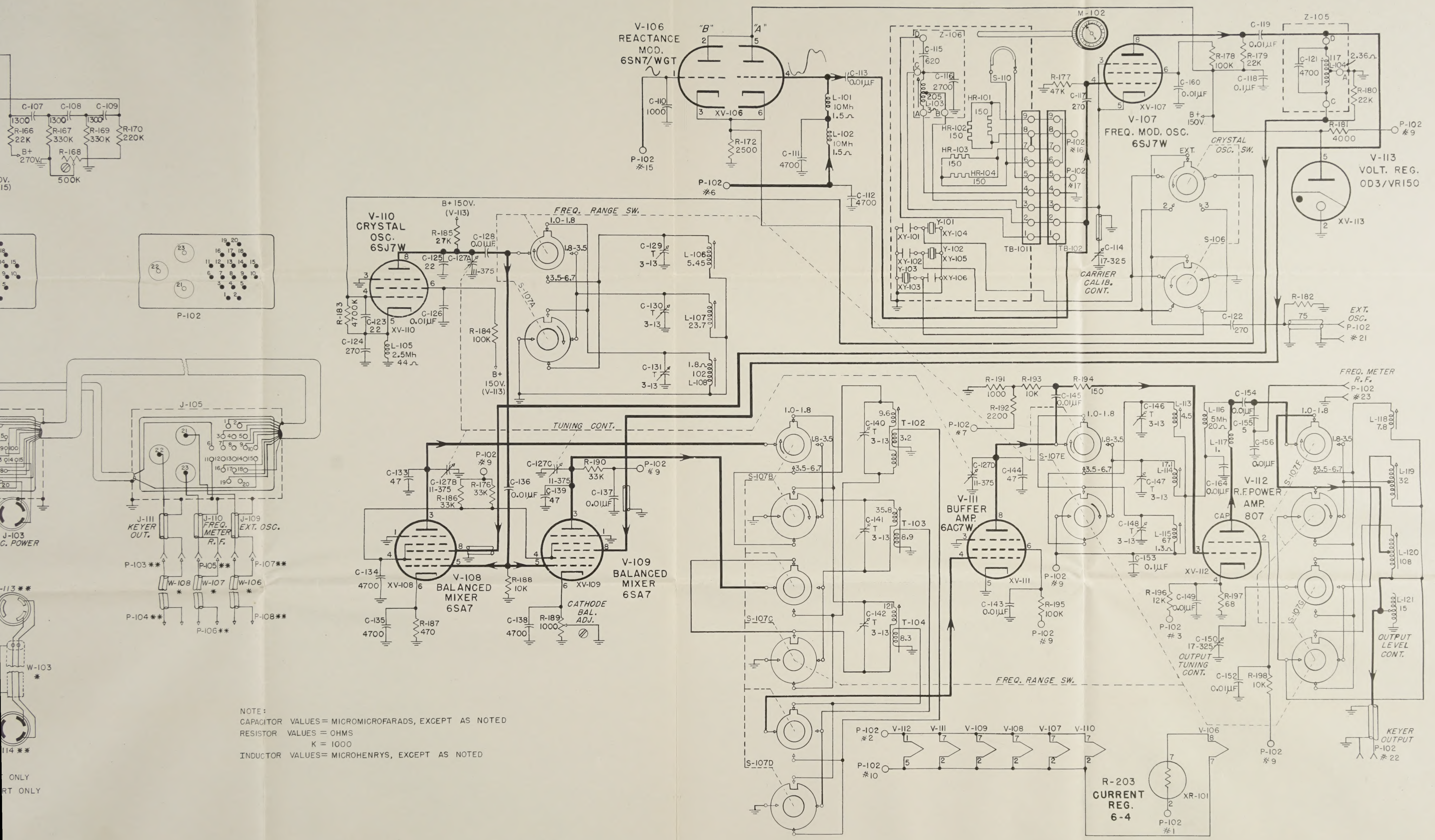
* SUPPLIED ON KY-58/GRT ONLY
** SUPPLIED ON KY-75/SRT ONLY

TEMPORARY CORRECTION T-2 TO INSTRUCTION BOOK FOR KEYERS KY-58/GRT AND KY-75/SRT (NAVSHIPS 91543)

The following revisions are to be made or noted on the appropriate page.

Page	Revision
1-2	Add to Para. 4. b.: Contract NObsr-57530, dated 16 June 1952.
3-7	Change Para. 2. d. (7) to read: Keyer connections to the photo scanner are made employing cable W-110 connected between the photo input jack J-113 and the photo scanner output circuit.
7-5	Change Step 6 of Para. 4. c. (4) to read: Connect a battery source of 5 to 20 volts to the photo input jack J-113 across pins C and B.
7-6	Change Step 12 of Para. 4. c. (4) to read: Return the battery connections to photo input jack J-113.
7-11	Change Step 1 of Para. 5. b. to read: Connect the battery to the photo input jack J-113. Connect the positive lead to pin C and the negative lead to pin B.
8-8	Add to Column 2 of E-101: marked: Photo input; includes J-113.
8-11	Add to Column 2 of E-122: marked: Photo Input; includes J-113.
8-13	Add to Column 8 of J-101; J-113. Change Column 9 to 3.
8-14	Add: J-113, Same as J-101, Photo Input jack.
8-31	Add to Column 8 of P-109: P-115; change Column 9 to 3. Add to Column 8 of P-110; P-116; change Column 9 to 3.
8-32	Add: P-115; Same as P-109; Part of W-110, Photo Input connector.
8-53	Add to Column 8 of W-101: W-110; change Column 9 to 2.
8-55	Add: W-110, Same as W-101, Photo Input cable.
8-	Add the following Standard Navy Stock Nos. to Column 5 of the components listed.

SYMBOL DESIG.	STANDARD NAVY STOCK NO.
A-101	N17-P-22382-8797
A-102	N17-P-22400-6601
A-103	N17-P-17693-5995
A-104	N16-C-10638-4381
A-105	N16-C-10638-4501
E-101	N17-C-74590-2001
E-102	N17-I-64844-3981
E-114	N16-K-700399-645
E-115	N16-K-700399-610
E-116	N16-K-700399-590
E-119	N16-C-95416-9281
E-120	N17-I-71134-3601
E-122	N16-I-85001-1003
H-102	N43-S-60167-9120
J-105	N17-C-73330-1950
J-106	N17-C-73330-1951
J-109B	N17-S-38251-1017
J-109C	N17-S-38251-1016
L-101	N16-C-75124-5231
L-103	N16-C-73981-4601
L-104	N16-C-73808-2801
L-105	N16-C-74714-8376
L-106	N16-C-76593-7751
L-107	N16-C-76635-5321
L-108	N16-C-76662-1721
L-113	N16-C-76581-2420
L-114	N16-C-76629-1201
L-115	N16-C-76652-4601
L-116	N16-C-74892-5673
L-117	N16-C-72778-8840
L-118	N16-C-76607-6509
L-119	N16-C-76645-3481
L-120	N16-C-76662-4005
L-121	N16-C-76425-8597
L-124	N16-C-76699-4151
N-101	N16-S-117101-574
N-102	N16-C-260001-167
O-117	N17-D-200001-121
O-118	N16-B-800214-778
O-122	N17-C-98378-8291
O-123	N17-C-98378-8381
O-127	N17-C-98378-7876
O-128	N16-B-300001-134
O-136	N16-B-200661-331
O-143	N16-N-88911-1003
O-144	N43-S-52840-5125
O-145	N16-G-900133-859
O-146	N16-P-400681-105
O-147	N17-G-155656-555
O-148	N16-P-404101-264
O-154	N16-S-21035-2766
O-155	N16-S-21065-5175
O-156	N16-S-20917-4456
O-157	N16-L-157001-121



NOTE:
CAPACITOR VALUES = MICROMICROFARADS, EXCEPT AS NOTED
RESISTOR VALUES = OHMS
K = 1000
INDUCTOR VALUES = MICROHENRYS, EXCEPT AS NOTED

SYMBOL DESIG.	STANDARD NAVY STOCK NO.
O-158	N16-L-157001-120
O-159	N17-S-46844-5806
O-160	N17-S-46844-5801
O-161	N42-R-56578-2203
O-163	N16-B-800265-647
O-164	N16-S-800649-551
O-165	N42-R-56566-2199
O-166	N16-S-20881-7976
O-167	N43-W-7508-3849
O-168	N16-L-150001-142
O-169	N16-N-88601-1022
O-174	N17-S-46777-5551
O-175	N54-B-2433
O-177	N42-C-13085-3083
O-179	N17-S-46772-4326
O-180	N43-N-9634-1225
O-181	N16-I-76611-1003
O-182	N16-I-76611-1002
O-183	N16-I-76611-1001
O-185	N16-I-76611-1004
O-187	N17-C-781444-634
O-188	N17-F-42376-8501
O-189	N17-F-42371-3001
O-190	N17-B-801498-363
O-192	N16-L-150001-146
O-193	N17-M-75717-8701
O-194	N42-R-2059-175
O-195	N16-H-500001-131
O-196	N43-N-99500-223
O-197	N16-W-180001-253
O-198	N16-G-500001-342
O-199	N16-G-432490-391
O-200	N16-K-48151-1003
O-201	N16-D-351301-104
O-202	N16-C-301143-101
P-101	N17-C-73626-8665
P-102	N17-C-73626-8666
P-113	N17-C-71168-1352
P-114	N17-C-71460-4063
R-102	N16-R-90656-6405
R-126	N16-R-79184-9909
R-127	N16-R-79180-2279
R-130	N16-R-79190-1589
R-133	N16-R-79195-6329
R-134	N16-R-79070-8755
R-135	N16-R-79102-3886
R-136	N16-R-79142-9999
R-138	N16-R-79029-2279
R-139	N16-R-78996-8539
R-162	N16-R-88180-9755
R-202	N16-R-66303-4607
S-101A	N17-S-91897-8834
S-101D	N17-D-200001-123
S-104A	N17-S-91897-8835
S-104E	N17-D-200001-124
T-101	N17-T-75701-8372
T-102	N17-T-82187-3321
T-103	N16-C-76489-4565
T-104	N17-T-82178-6176
V-105	N16-T-56665
W-101	N17-C-48193-1256
W-102	N17-C-48193-1251
W-103	N17-C-48193-1261
W-104	N17-S-690701-163
W-105	N17-S-690701-162
W-106	N16-C-11586-8847
W-107	N16-C-11586-8848
W-108	N16-C-11586-8849
W-109	N17-B-48894-9003
Z-105	N16-C-76662-7275
Z-106	N16-C-76674-3050
TB-101	N17-B-77892-3306
TB-102	N17-B-77892-3301
TB-103	N17-B-78137-8070
TB-104	N17-B-78137-8072
TB-105	N17-B-78034-1106
TB-106	N17-B-78333-8635
XI-101	N17-L-76683-2777
XI-101A	N17-L-250028-214
XI-102	N17-L-76854-4282
XI-102A	N17-L-250627-561
XI-103	N17-L-76901-1376
XI-103A	N17-L-250845-191
XY-104	N16-S-54520-7551

NAVSHIPS 91543

INSTRUCTION BOOK
for
KEYERS
KY-58/GRT AND KY-75/SRT

NATIONAL COMPANY, INC.
MALDEN 48, MASSACHUSETTS

BUREAU OF SHIPS NAVY DEPARTMENT

Contracts: NObsr-42513
NObsr-52052
NObsr-57530

Approved by BuShips: 6 OCTOBER 1951
Change 1: 19 DECEMBER 1952

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
Title Page	Change 1	3–7	Change 1
A	Change 1	3–8 to 3–10	Original
B	Change 1	4–1 to 4–4	Original
C	Original	5–1 to 5–4	Original
i to vi	Original	6–1 to 6–2	Original
1–0 to 1–6	Original	7–0 to 7–28	Original
2–1 to 2–6	Original	7–29 to 7–30	Change 1
2–7	Change 1	7–31 to 7–32	Original
2–8 to 2–19	Original	7–33 to 7–34	Change 1
3–0	Change 1	7–35 to 7–42	Original
3–1	Original	7–43	Change 1
3–2	Change 1	8–0 to 8–64	Original
3–3 to 3–6	Original		

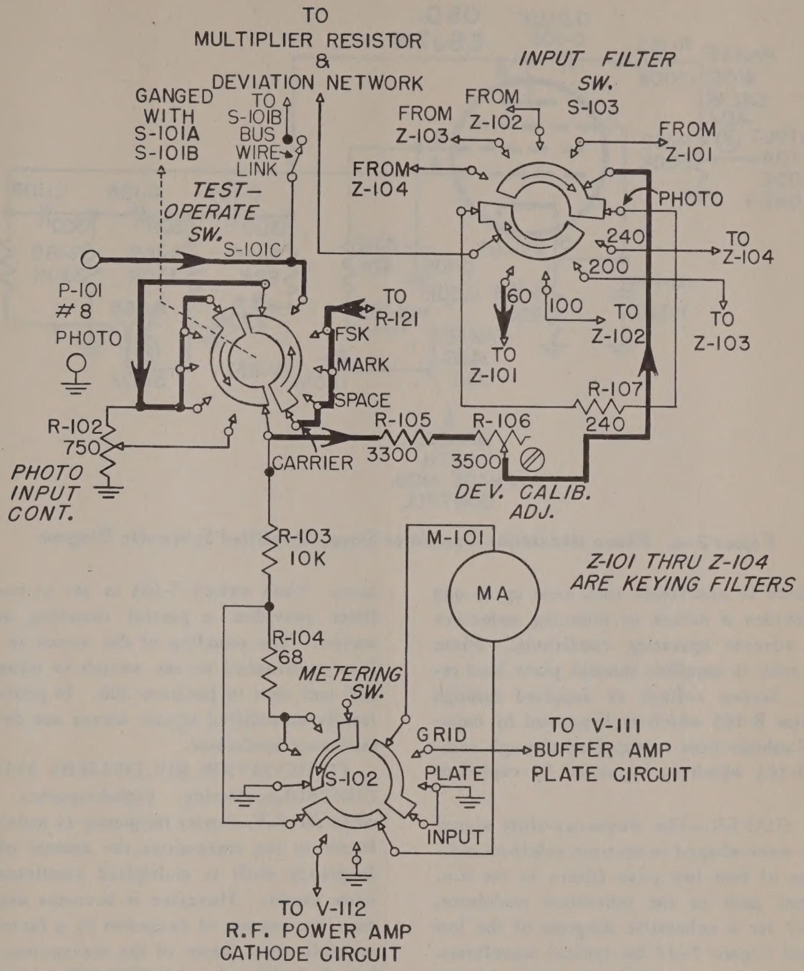


Figure 2-5. Photo Input Stages, Simplified Schematic Diagram

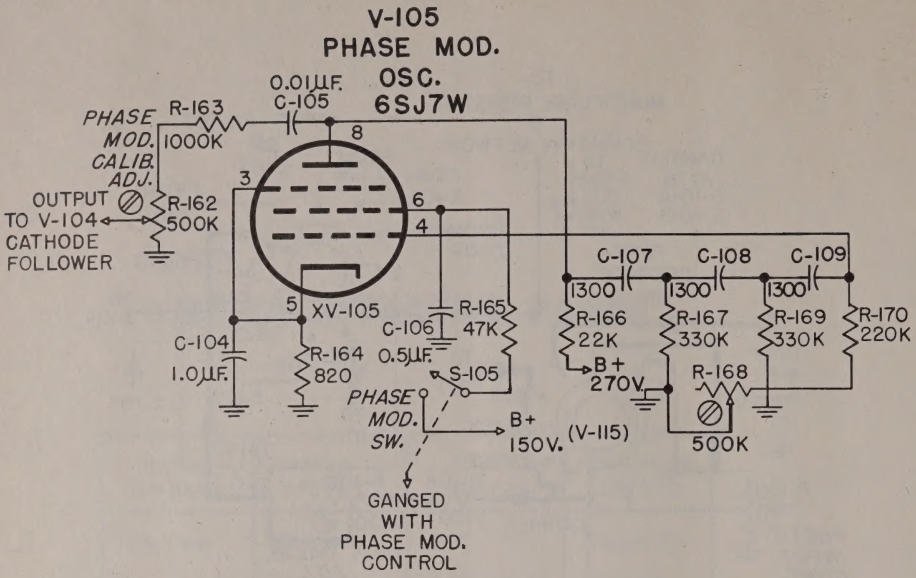


Figure 2–6. Phase Modulation Oscillator Stage, Simplified Schematic Diagram

phase shift which is adjustable from zero up to one radian and provides a means of reducing selective fading during adverse operating conditions. Plate voltage of the tube is supplied through plate load resistor R-166. Screen voltage is supplied through dropping resistor R-165 which is bypassed by capacitor C-106. Cathode bias is supplied through cathode resistor R-164 which is bypassed by capacitor C-104.

(6) PULSE SHAPER.—The frequency-shift signal transitions are wave-shaped to restrict sideband radiation by means of four low pass filters in the d.c. telegraph signal path to the reactance modulator. See Figure 2–7 for a schematic diagram of the low pass filters and Figure 7–17 for typical waveforms. The telegraph signal output of the limiting tube circuit is a series of square waves. If these square waves are rounded before being passed to the reactance modulator, there are fewer sidebands generated due to the partial elimination of the harmonic content of the square wave. The reduction of sidebands permits the assignment of closer radio-channel spacing for telegraph operation with the keyer.

Four low pass filters, capable of 30 db. attenuation to frequencies above the third harmonic of the keying speed, are used to accomodate a range of signaling speeds of 60, 100, 200 and 240 dot-cycles per second. The respective filter is selected by the five-position input FILTER switch S-103. The fifth position disconnects the filters during photo transmission. When switch S-103 is set at position 60, the filter provides a partial rounding of the square waves. The rounding of the waves is progressively less pronounced as the switch is turned to position 100 and then to position 200. In position 240 practically unmodified square waves are delivered to the reactance modulator.

(7) DEVIATION MULTIPLIERS AND DEVIATION CONTROLS.—During high-frequency transmission when the R.F. carrier frequency is multiplied by some factor in the transmitter, the amount of deviation of frequency shift is multiplied simultaneously by the same factor. Therefore it becomes necessary to reduce the amount of deviation by a factor equal to the multiplication factor of the transmitter. This is accomplished by the MULTIPLIER switch S-104 which provides a means of dividing the frequency deviation by a factor of 1, 2, 3, 4, 6, 8, 9 or 12, thereby keeping the deviation at its preset amount regardless of the frequency multiplication employed in the transmitter. See Figure 2–8 for a schematic diagram of these stages. The deviation division is obtained by the use of a voltage divider network of series-shunt connected non-inductive precision resistors in conjunction with the MULTIPLIER switch S-104. The voltage divider network is so arranged that as the amount of deviation is divided a small resistance is shunted across the Deviation control and a large resistance is placed in series with the control thereby holding the waveshaping filter termination at 5000

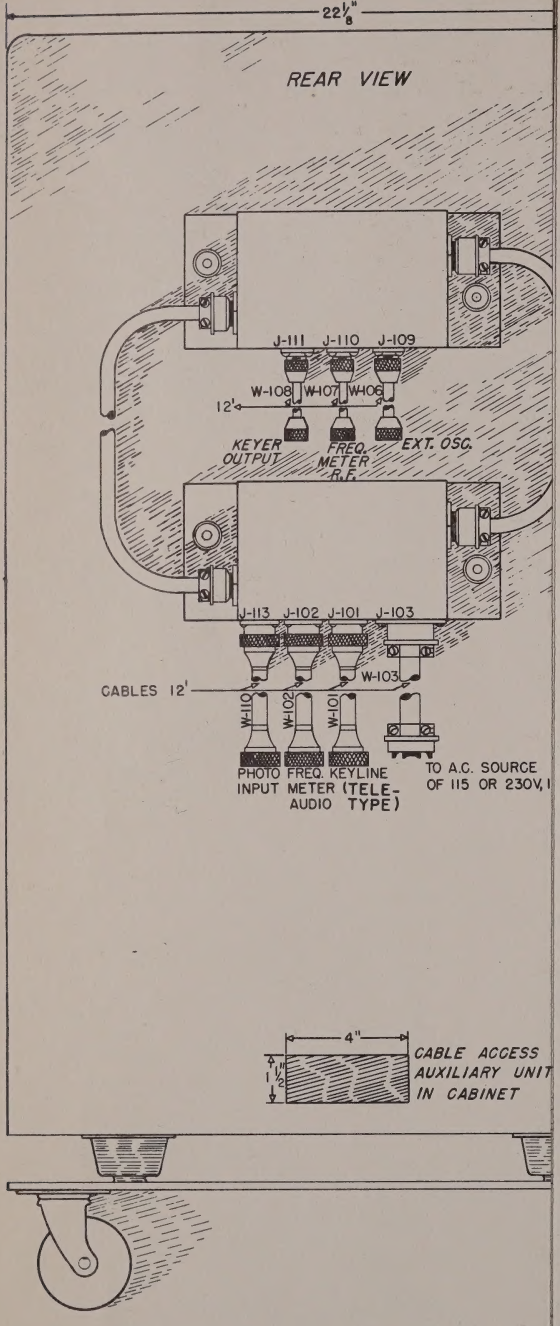


Figure 3–1. Keyer KY-58/GRT, Dimensional

SECTION 3
INSTALLATION

1. UNPACKING.

The Keyers KY-58/GRT or KY-75/SRT and equipment repair parts are carefully packed in separate wooden crates for overseas shipment. One set of cables is provided with the KY-58/GRT. No cables are supplied with the KY-75/SRT but all connectors required to make up the necessary cables are provided. Two instruction books are shipped with the equipment. The equipment is contained in moisture-proof barrier cartons having an 18 months supply of Silica Gel. Do not open the cartons until the equipment is being installed, as the Silica Gel will saturate rapidly upon exposure to humid atmosphere. The recommended procedure to employ in unpacking each piece of equipment is as follows.

Step 1. Cut the metal straps around the crate and remove the side that reads 'Open This Side'. The cover is secured by nails and an ordinary nail puller or claw hammer may be employed.

Step 2. Remove sufficient filler material from the crate to permit access to the carton. Lift out the packaged items.

Step 3. Remove the outer water-proof wrapper and remove the outer carton.

Step 4. Cut the moisture-vaporproof barrier along the heat-sealed seam and remove the barrier.

Step 5. Open the inner carton and remove the dessicant.

Step 6. Lift the equipment out of the carton.

Step 7. Inspect the equipment for any damage incurred during shipment.

Step 8. The equipment spare parts set is packed in a manner similar to the keyer and its unpacking will follow the procedure outlined above in steps 1 through 7.

Step 9. The packing crates and packing material should be saved in event the equipment has to be repacked and shipped at a later date.

2. INSTALLATION.

Both units of the keyer are designed for mounting in the cabinet furnished for this purpose. Both sub-units may, however, be mounted in any standard 19-inch rack panel. When this is done it will be necessary to secure the blister assembly to the units. This is accomplished by means of the four 10-32'' screws packed in the equipment repair parts box. Thread the screws through the opening in the head of the captive thumb screws at each side of the blisters until they are securely engaged into the chassis.

WARNING

> Voltages employed in the associated transmitter are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment. NEVER MEASURE POTENTIALS IN EXCESS OF 1000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

a. POSITIONING OF CABINET.

(1) KY-58/GRT.—When determining the location of the cabinet make sure that a minimum access space of approximately two feet is provided at the rear of the cabinet or the location is such that the cabinet may be rolled forward to permit access to the back. See Figure 3–1 for a dimensional drawing. This is adequate space for servicing (removal of blisters). Place the cabinet CY-1132/GRT in that part of the room where the temperature will be more or less constant i.e. not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter. Cables furnished for connections to the transmitter and other external equipment are 12 feet long.

(2) KY-75/SRT.—When mounting the KY-75/SRT cabinet CY-1133/SRT atop an operating table or bench allow sufficient space at the rear of the cabinet to permit access to the blister units. See Figure 3–2 for a dimensional outline drawing. Place the cabinet in that part of the room where the temperature will be more or less constant i.e., not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter.

b. ARRANGEMENT OF UNITS.—The blank panel in the bottom section of Keyer KY-58/GRT may be removed in the event it is desired to mount other equipment in the cabinet. Make sure that all mounting screws are turned tightly into place.

c. INSTALLATION OF CRYSTALS.—Crystals for operation of the keyer are not supplied by the contractor. Crystals for equipment operation are furnish-

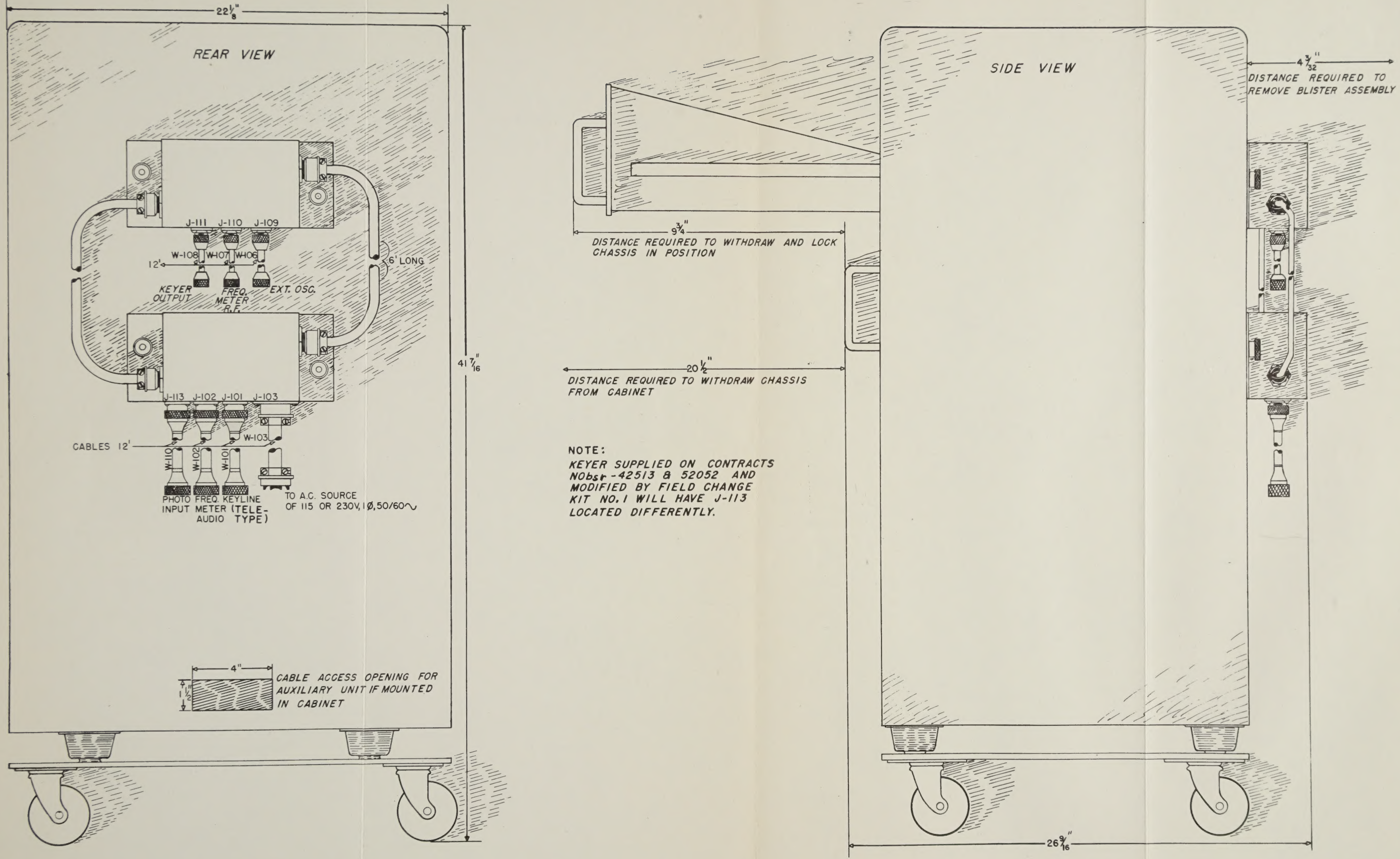

22 1/8"
REAR VIEW
J-111 J-110 J-109
W-108 W-107 W-106
12'
6' LONG
KEYER OUTPUT
FREQ. METER R.F.
EXT. OSC.
41 7/16"
J-113 J-102 J-101 J-103
CABLES 12'
W-103
W-110
W-102
W-101
PHOTO INPUT
FREQ. METER (AUDIO)
KEYLINE (TELE-TYPE)
TO A.C. SOURCE OF 115 OR 230V, 1Ø, 50/60∿
4"
1 1/2"
CABLE ACCESS OPENING FOR AUXILIARY UNIT IF MOUNTED IN CABINET
SIDE VIEW
4 3/32"
DISTANCE REQUIRED TO REMOVE BLISTER ASSEMBLY
9 3/4"
DISTANCE REQUIRED TO WITHDRAW AND LOCK CHASSIS IN POSITION
20 1/2"
DISTANCE REQUIRED TO WITHDRAW CHASSIS FROM CABINET
NOTE:
KEYER SUPPLIED ON CONTRACTS NObsr-42513 & 52052 AND MODIFIED BY FIELD CHANGE KIT NO. 1 WILL HAVE J-113 LOCATED DIFFERENTLY.
26 9/16"

Figure 3–1. Keyer KY-58/GRT, Dimensional Outline and External Connection Drawing

SECTION 3
INSTALLATION

1. UNPACKING.

The Keyers KY-58/GRT or KY-75/SRT and equipment repair parts are carefully packed in separate wooden crates for overseas shipment. One set of cables is provided with the KY-58/GRT. No cables are supplied with the KY-75/SRT but all connectors required to make up the necessary cables are provided. Two instruction books are shipped with the equipment. The equipment is contained in moisture-proof barrier cartons having an 18 months supply of Silica Gel. Do not open the cartons until the equipment is being installed, as the Silica Gel will saturate rapidly upon exposure to humid atmosphere. The recommended procedure to employ in unpacking each piece of equipment is as follows.

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Step 7. Inspect the equipment for any damage incurred during shipment.

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WARNING

Voltages employed in the associated transmitter are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment. NEVER MEASURE POTENTIALS IN EXCESS OF 1000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

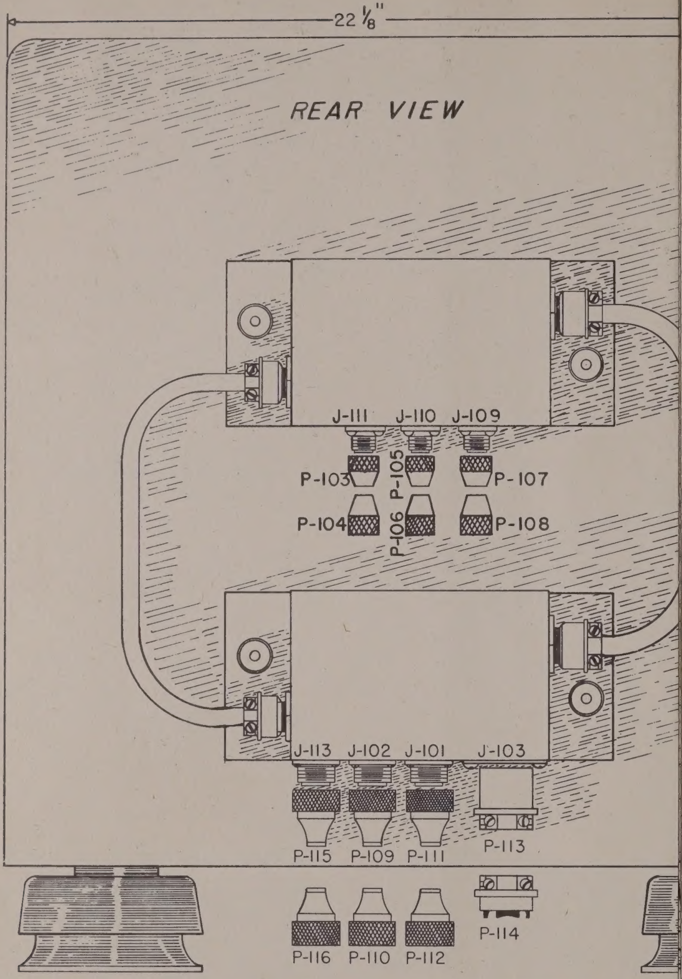
a. POSITIONING OF CABINET.

(1) KY-58/GRT.—When determining the location of the cabinet make sure that a minimum access space of approximately two feet is provided at the rear of the cabinet or the location is such that the cabinet may be rolled forward to permit access to the back. See Figure 3–1 for a dimensional drawing. This is adequate space for servicing (removal of blisters). Place the cabinet CY-1132/GRT in that part of the room where the temperature will be more or less constant i.e. not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter. Cables furnished for connections to the transmitter and other external equipment are 12 feet long.

(2) KY-75/SRT.—When mounting the KY-75/SRT cabinet CY-1133/SRT atop an operating table or bench allow sufficient space at the rear of the cabinet to permit access to the blister units. See Figure 3–2 for a dimensional outline drawing. Place the cabinet in that part of the room where the temperature will be more or less constant i.e., not near any direct source of heat or cold. The keyer should be placed as close as possible to its associated transmitter.

b. ARRANGEMENT OF UNITS.—The blank panel in the bottom section of Keyer KY-58/GRT may be removed in the event it is desired to mount other equipment in the cabinet. Make sure that all mounting screws are turned tightly into place.

c. INSTALLATION OF CRYSTALS.—Crystals for operation of the keyer are not supplied by the contractor. Crystals for equipment operation are furnish-



FUNCTION	PLUG	TYPE	RECOMMENDED C
KEYER OUTPUT	P-103 & P-104	-49195	TYPE RG-8/U
FREQ. METER R. F.	P-105 & P-106	-49195	TYPE RG-8/U
EXT. OSC.	P-107 & P-108	-49195	TYPE RG-8/U
FREQ. METER AUDIO	P-109 P-110	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
KEYLINE (TELETYPE)	P-111 P-112	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
A.C. LINE, 115 OR 230V, ∅, 50/60 ∿	P-113 P-114	3WIRE POLARIZED (FEMALE) HUBBELL #7559-G 3WIRE POLARIZED (MALE) HUBBELL #7311-G	TYPE MCOS-2
PHOTO INPUT	P-115 P-116	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2

Figure 3–2. Keyer KY-75/SRT, Dimensional Outline and External Conn

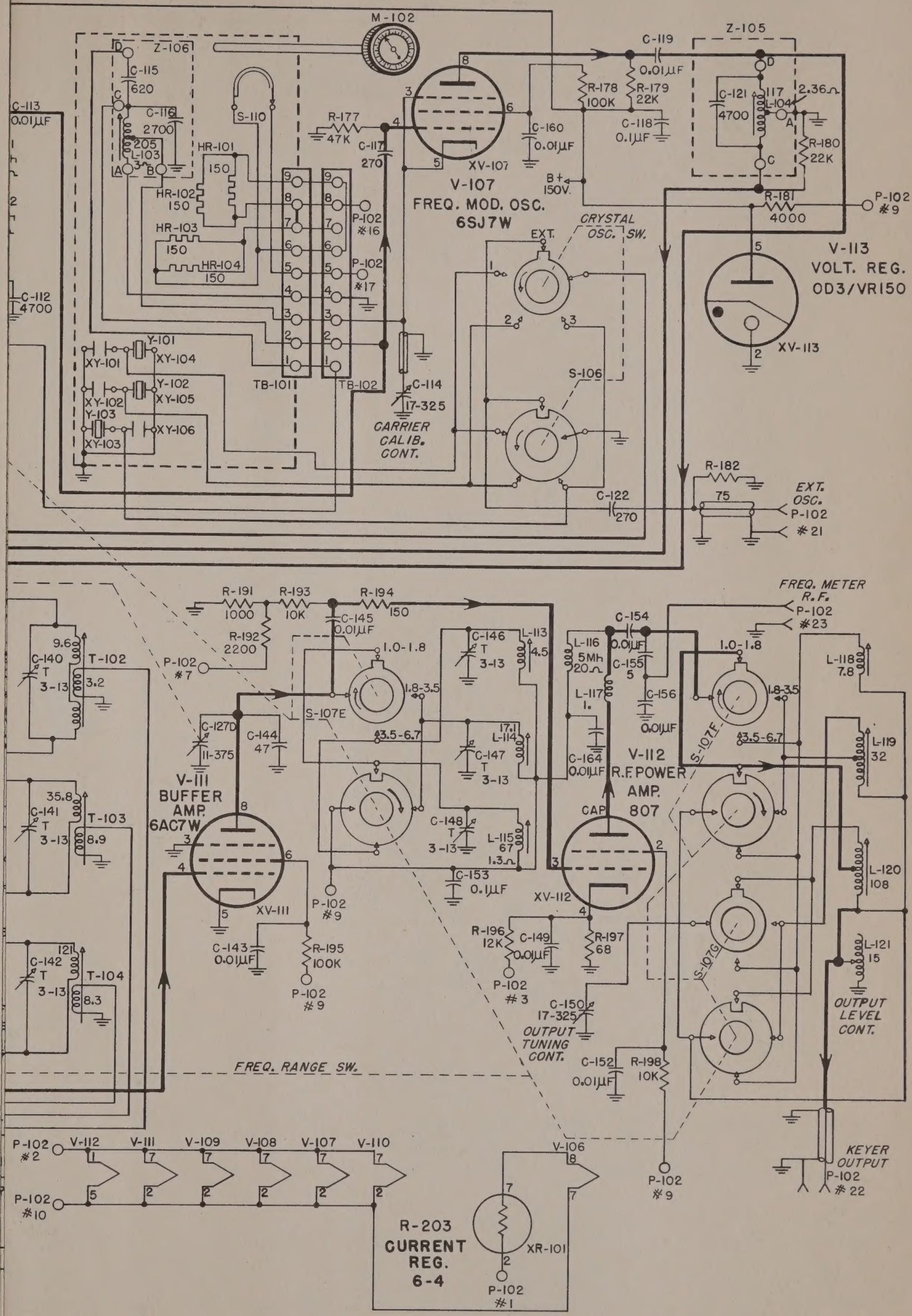
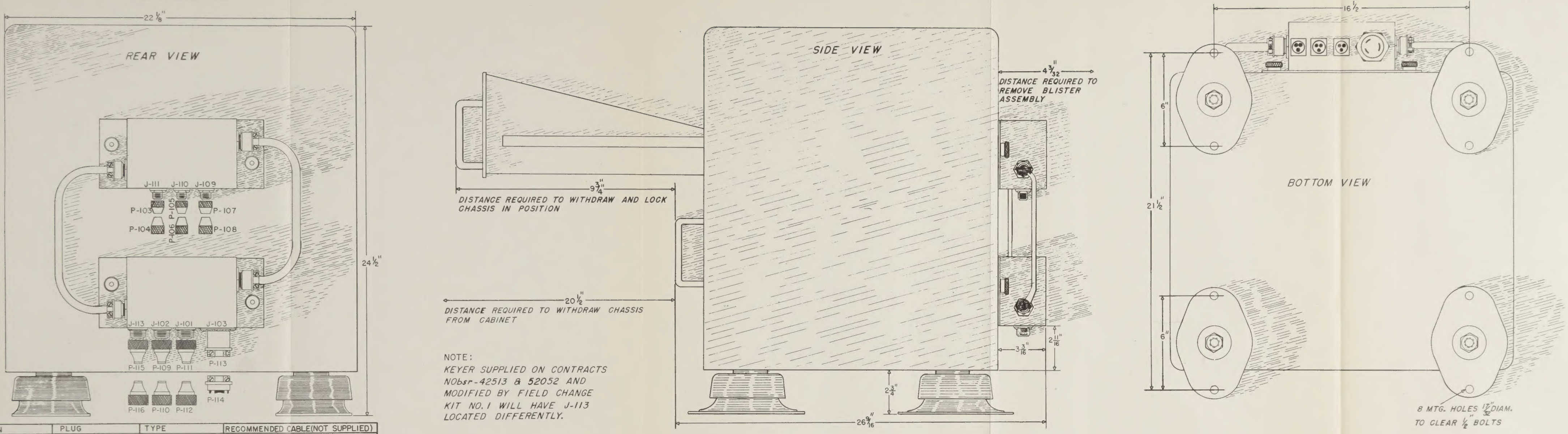


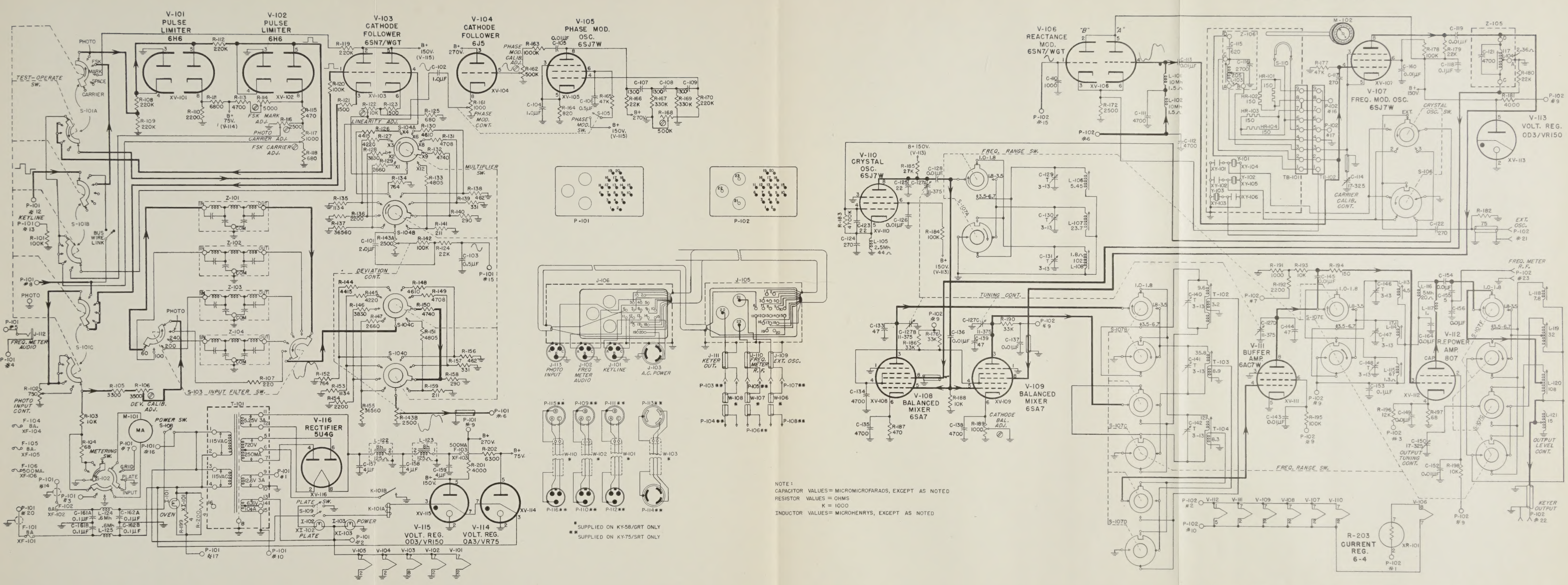
Figure 7–21. Schematic Diagram, KY-58/GRT and KY-75/SRT Keyers



NOTE:
KEYER SUPPLIED ON CONTRACTS NObsr-42513 & 52052 AND MODIFIED BY FIELD CHANGE KIT NO. 1 WILL HAVE J-113 LOCATED DIFFERENTLY.

FUNCTION	PLUG	TYPE	RECOMMENDED CABLE(NOT SUPPLIED)
KEYER OUTPUT	P-103 & P-104	-49195	TYPE RG-8/U
FREQ. METER R. F.	P-105 & P-106	-49195	TYPE RG-8/U
EXT. OSC.	P-107 & P-108	-49195	TYPE RG-8/U
FREQ. METER AUDIO	P-109 P-110	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
KEYLINE (TELETYPE)	P-111 P-112	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2
A.C. LINE, 115 OR 230V, ø, 50/60 ∿	P-113 P-114	3WIRE POLARIZED (FEMALE) HUBBELL #7559-G 3WIRE POLARIZED (MALE) HUBBELL #7311-G	TYPE MCOS-2
PHOTO INPUT	P-115 P-116	AN3106B-14S-1S AN3106B-14S-1P	TYPE MCOS-2

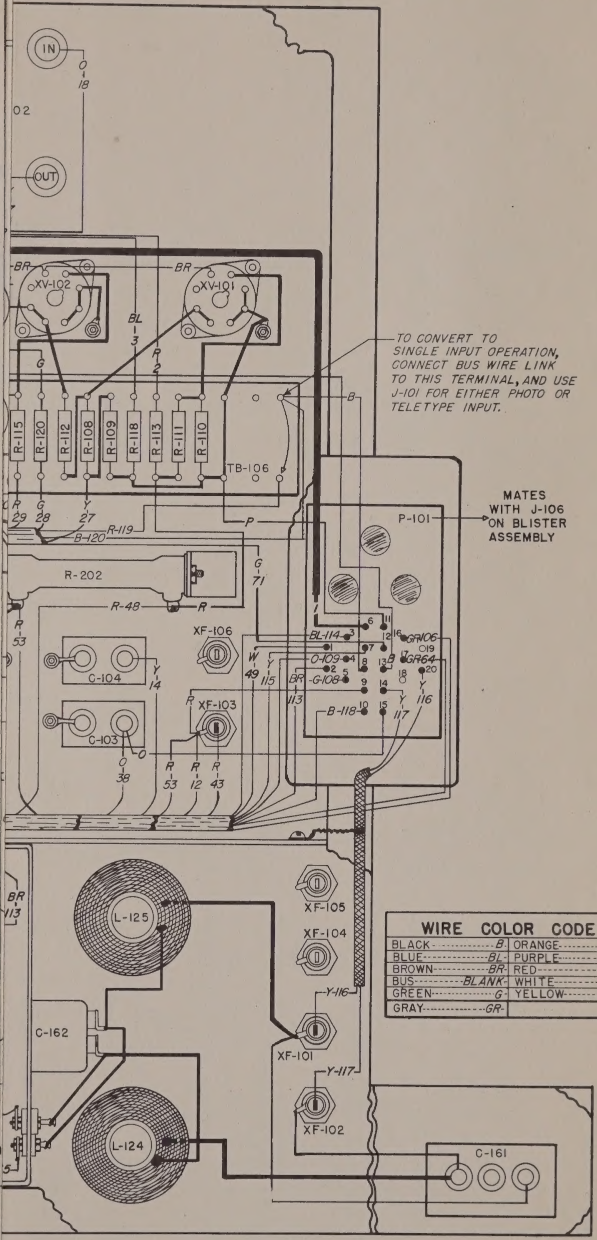
Figure 3-2. Keyer KY-75/SRT, Dimensional Outline and External Connection Drawing



NOTE:
CAPACITOR VALUES = MICROMICROFARADS, EXCEPT AS NOTED
RESISTOR VALUES = OHMS
K = 1000
INDUCTOR VALUES = MICROHENRYS, EXCEPT AS NOTED

*SUPPLIED ON KY-58/GRT ONLY
**SUPPLIED ON KY-75/SRT ONLY

Figure 7-21. Schematic Diagram, KY-58/GRT and KY-75/SRT Keyers

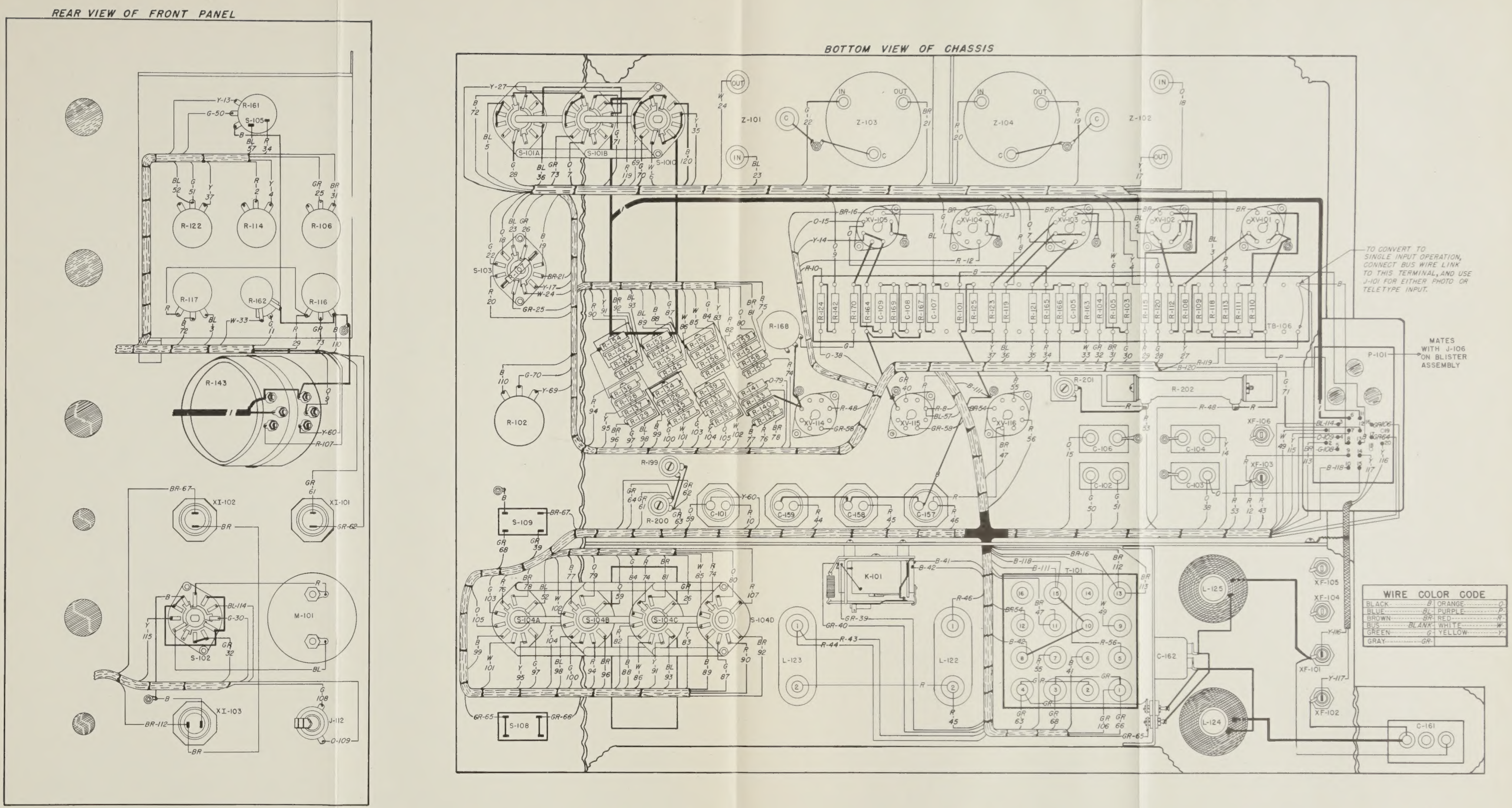


TO CONVERT TO SINGLE INPUT OPERATION, CONNECT BUS WIRE LINK TO THIS TERMINAL, AND USE J-101 FOR EITHER PHOTO OR TELETYPE INPUT.

MATES WITH J-106 ON BLISTER ASSEMBLY

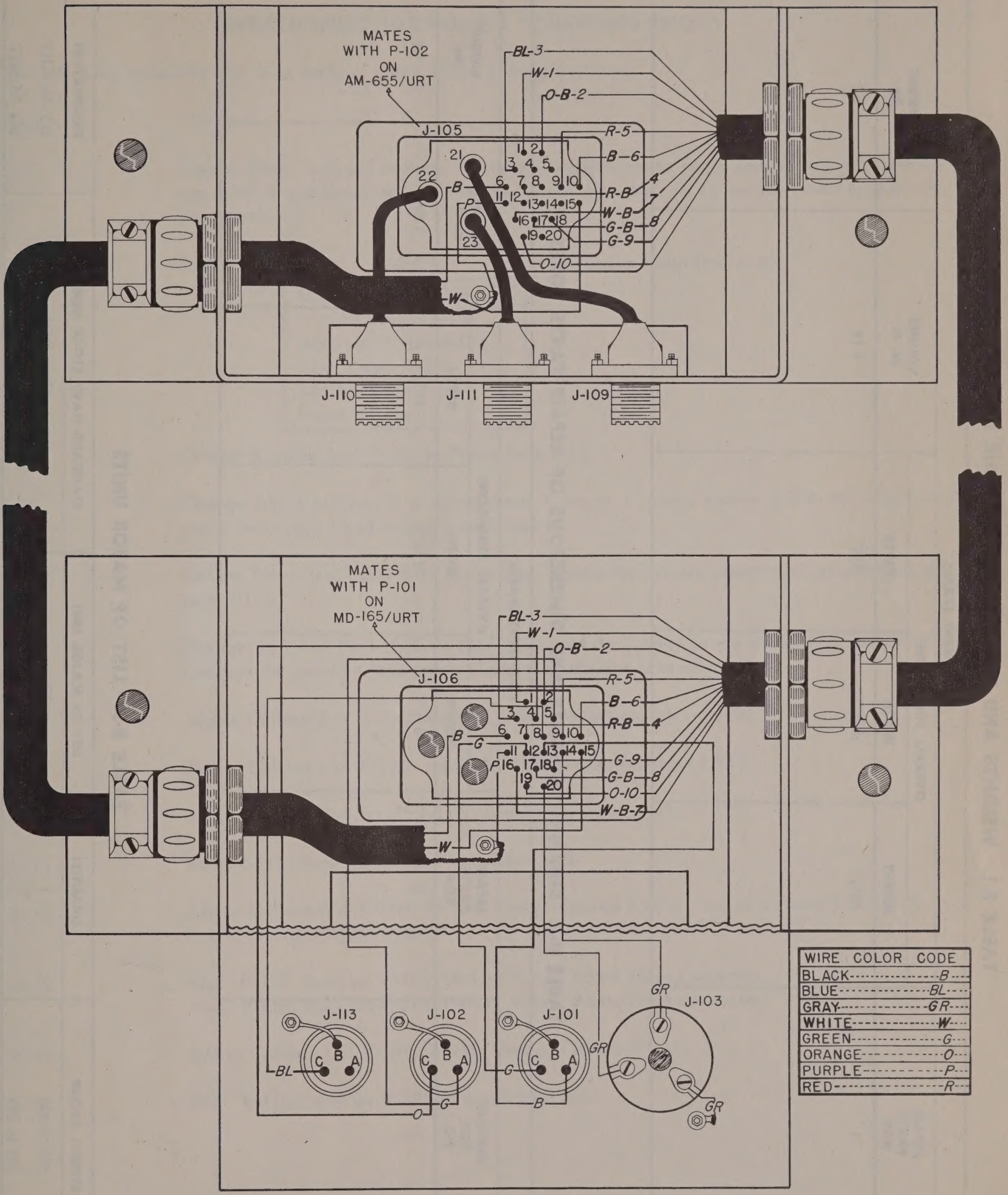
WIRE COLOR CODE	
BLACK ---------- B	ORANGE ---------- O
BLUE ---------- BL	PURPLE ---------- P
BROWN ---------- BR	RED ---------- R
BUS ---------- BLANK	WHITE ---------- W
GREEN ---------- G	YELLOW ---------- Y
GRAY ---------- GR	

g Diagram, Modulator-Power Supply MD-165/URT



WIRE COLOR CODE			
BLACK	B	ORANGE	O
BLUE	BL	PURPLE	P
BROWN	BR	RED	R
BUS	BLANK	WHITE	W
GREEN	G	YELLOW	Y
GRAY	GR		

Figure 7–23. Practical Wiring Diagram, Modulator-Power Supply MD-165/URT



WIRE COLOR CODE	
BLACK	B
BLUE	BL
GRAY	GR
WHITE	W
GREEN	G
ORANGE	O
PURPLE	P
RED	R

Figure 7–32. Practical Wiring Diagram of Blister Assembly, KY-58/GRT and KY-75/SRT Keyers

TABLE 8-1. WEIGHTS AND DIMENSIONS OF REPAIR PARTS BOXES

EQUIPMENT SPARES					
REPAIR PARTS BOX	OVERALL DIMENSIONS			VOLUME cu. ft.	WEIGHT lbs.
	HEIGHT	WIDTH	DEPTH		
1	12¼″	18¼″	9⅛″	1.18	52

TABLE 8-2. SHIPPING WEIGHTS AND DIMENSIONS OF REPAIR PARTS BOXES

EQUIPMENT SPARES						
SHIPPING BOX NO.	REPAIR PARTS BOX	OVERALL DIMENSIONS			VOLUME cu. ft.	WEIGHT lbs.
		HEIGHT	WIDTH	DEPTH		
1	1	13⅞″	21⅝″	10⅞″	1.89	65

TABLE 8-3. LIST OF MAJOR UNITS

SYMBOL GROUP	QUANTITY	LIST OF MAJOR UNIT	STANDARD NAVY STOCK NUMBER	DESIGNATION
101 to 299	1	Keyer	F16-K-47681-1001	KY-58/GRT
	or			
101 to 299	1	Keyer	F16-K-47672-9201	KY-75/SRT

ERRATA SHEET TO CHANGE 1 TO NAVSHIPS 91543

The following revisions are to be made or noted on the appropriate page.

Page	Revision
3–7	Change Para. 2. d. (7) to read: Keyer connections to the photo scanner are made employing cable W-110 connected between the photo input jack J-113 and the photo scanner output circuit.
7–2	In the block CHECK under Photo Operation Loose or broken contacts on Switch S-101 Metering Switch S-102 Input Cable W-101 Keyline Jack J-101 Photo Scanner Change Keyline Jack J-101 to Photo Jack J-113
7–5	Change Step 6 of Para. 4. c. (4) to read: Connect a battery source of 5 to 20 volts to the photo input jack J-113 across pins C and B.
7–6	Change Step 12 of Para. 4. c. (4) to read: Return the battery connections to photo input jack J-113.
7–11	Change Step 1 of Para. 5. b. to read: Connect the battery to the photo input jack J-113. Connect the positive lead to pin C and the negative lead to pin B.
8–8	Add to Column 2 of E-101: marked: Photo input; includes J-113.
8–11	Add to Column 2 of E-122: marked: Photo input; includes J-113.
8–13	Add to Column 8 of J-101; J-113. Change Column 9 to 3.
8–14	Add: J-113, Same as J-101, Photo Input jack.
8–31	Add to Column 8 of P-109: P-115; change Column 9 to 3. Add to Column 8 of P-110: P-116; change Column 9 to 3.
8–32	Add: P-115; Same as P-109; Part of W-110, Photo Input connector. Add: P-116; Same as P-110; Part of W-110, Photo Input connector.
8–53	Add to Column 8 of W-101: W-110; change Column 9 to 2.
8–55	Add: W-110, Same as W-101, Photo Input cable.

Manufactured in U S A by
[illegible] PRODUCTS, INC.
[illegible]